Content Scope & Sequence

GRADE K

SCOTT FORESMAN

Investigations

IN NUMBER, DATA, AND SPACE®

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Who Is in School Today?

Mathematical Emphases

❶ Counting and Quantity Developing strategies for accurately counting a set of objects by ones

Math Focus Points

- Counting the number of students in the class
- Using the calendar to count days
- Connecting number names, numerals, and quantities
- Establishing one-to-one correspondence between equal groups (e.g., students and cubes)
- Developing strategies for accurately counting and keeping track of quantities up to the number of students in the class
- Creating an equivalent set
- Counting, creating, and representing quantities

❷ Data Analysis Sorting and Classifying

Math Focus Points

- Identifying attributes (e.g., color, size, and shape) and developing language to describe them
- Comparing how objects are the same and different
- Finding objects that share one attribute
- Using attributes to sort a group of objects

❸ Data Analysis Carrying out a data investigation

Math Focus Points

- Collecting and keeping track of survey data
- Describing and comparing the number of pieces of data in each category
- Interpreting results of a data investigation

❹ Whole-Number Operations Using manipulatives, drawings, tools, and notation to show strategies and solutions

Math Focus Points

- Exploring math manipulatives and their attributes
- Using the calendar as a tool for keeping track of time and events
- Representing quantities with pictures, numbers, objects, and/or words

This Unit also focuses on

- Developing language to describe shapes, position, and quantity

Classroom Routines focus on

- Developing strategies for counting accurately
- Considering whether order matters when you count
- Comparing quantities
- Using the calendar as a tool for keeping track of time
- Collecting, counting, representing, describing, and comparing data

Counting and Comparing (Measurement and the Number System 1)

Mathematical Emphases

❶ Counting and Quantity Developing strategies for accurately counting a set of objects by ones

Math Focus Points

- Developing strategies for accurately counting and keeping track of quantities up to 12
- Connecting number words, numerals, and quantities
- Developing visual images for quantities up to 6
- Counting backwards

❷ Counting and Quantity Developing the idea of equivalence

Math Focus Points

- Creating an equivalent set
- Considering whether order matters when you count

❸ Linear Measurement Understanding length

Math Focus Points

- Directly comparing two objects to determine which is longer
- Sorting objects into two categories according to length
- Developing language to describe and compare lengths (long, longer than, short, shorter than, the same, equal to)

❹ Counting and Quantity Developing an understanding of the magnitude and position of numbers

Math Focus Points

- Comparing two (or more) quantities to determine which is more
- Developing language for comparing quantities (more, greater, less, fewer, most, least, fewest, same, and equal to)
- Ordering quantities from least to most

❺ Whole-Number Operations Using manipulatives, drawings, tools, and notation to show strategies and solutions

Math Focus Points

- Representing quantities with pictures, numbers, objects, and/or words
- Using numerals to represent quantities
- Using a Ten-Frame to develop visual images of quantities up to 10

Classroom Routines focus on

- Developing strategies for counting accurately
- Considering whether order matters when you count
- Using the calendar as a tool for keeping track of time
- Collecting, counting, representing, describing, and comparing data

Assessed Benchmarks

- Count a set of up to 10 objects
- Decide which of two objects is longer
- Compare two quantities up to 10 to see which is greater

What Comes Next? (Patterns and Functions)

Mathematical Emphases

❶ Data Analysis Sorting and classifying

Math Focus Points

- Finding objects that share one attribute
- Using attributes to sort a group of objects
- Comparing how objects are the same and different

❷ Repeating Patterns Constructing, describing, and extending repeating patterns

Math Focus Points

- Copying, constructing, comparing, describing, and recording repeating patterns
- Determining what comes next in a repeating pattern
- Comparing repeating and nonrepeating arrangements
- Distinguishing between patterns and nonpatterns
- Constructing a variety of patterns using the same elements
- Comparing different kinds of patterns

❸ Repeating Patterns Identifying the unit of a repeating pattern

Math Focus Points

- Identifying the unit of a repeating pattern
- Counting the number of units in a repeating pattern
- Extending a repeating pattern by adding on units to the pattern

This Unit also focuses on

- Observing and describing
- Using information to figure out what is missing
- Counting, creating, and representing quantities
- Counting 12 objects

Classroom Routines focus on

- Developing strategies for counting accurately
- Considering whether order matters when you count
- Comparing quantities
- Using the calendar as a tool for keeping track of time
- Collecting, counting, representing, describing, and comparing data
- Determining what comes next in a repeating pattern
- Describing repeating patterns

Assessed Benchmarks

- Copy, construct, and extend simple repeating patterns, such as AB, ABC
- Begin to identify the unit of a repeating pattern

Measuring and Counting (Measurement and the Number System 2)

Mathematical Emphases

❶ Linear Measurement Understanding length and using linear units

Math Focus Points

- Understanding what length is
- Identifying the longest dimension of an object
- Comparing lengths of different objects
- Repeating multiple nonstandard units to quantify length
- Developing strategies for measuring the length of an object

❷ Counting and Quantity Developing strategies for accurately counting a set of objects by ones

Math Focus Points

- Counting a set of objects and creating an equivalent set
- Connecting number words, numerals, and quantities
- Keeping track of a growing set of objects
- Counting spaces and moving on a gameboard
- Creating a set of a given size
- Developing and analyzing visual images for quantities up to 10

❸ Whole-Number Operations. Making sense of and developing strategies to solve addition and subtraction problems with small numbers

Math Focus Points

- Finding the total after a small amount (1, 2, 3) is added to a set of up to 7
- Combining two amounts
- Modeling the action of combining and separating situations
- Separating one amount from another
- Adding or subtracting one to/from numbers up to 10
- Adding to or subtracting from one quantity to make another quantity
- Decomposing numbers in different ways
- Exploring combinations of a number (e.g., 6 is 3 and 3 and also 5 and 1)

❹ Counting and Quantity Developing an understanding of the magnitude and position of numbers

Math Focus Points

- Developing an understanding of more than and fewer than
- Comparing two quantities to determine which is more

❺ Whole-Number Operations Using manipulatives, drawings, tools, and notation to show strategies and solutions

Math Focus Points

- Recording measurements with pictures, numbers, and/or words
- Using numbers to represent quantities and to record how many
- Using a Ten-Frame to develop visual images of quantities up to 10
- Recording an arrangement of a quantity

This Unit also focuses on

- Thinking strategically about moves on a gameboard

Classroom Routines focus on

- Using the calendar as a tool for keeping track of time
- Developing strategies for counting accurately
- Considering whether order matters when you count
- Comparing quantities
- Collecting, counting, representing, describing, and comparing data
- Determining what comes next in a repeating pattern
- Describing repeating patterns

Assessed Benchmarks

- Measure the length of an object by lining up multiple units
- Count a set of up to 15 objects
- Figure out what is one more or one fewer than a number

Make a Shape, Build a Block (2-D and 3-D Geometry)

Mathematical Emphases

❶ Features of Shapes Describing, identifying, comparing, and sorting 2-D and 3-D shapes

Math Focus Points

- Developing language to describe and compare 2-D and 3-D shapes and their attributes
- Relating 2-D and 3-D shapes to real-world objects
- Describing the attributes of circles and rectangles
- Describing the attributes of triangles and squares
- Exploring relationships among pattern block shapes
- Comparing the faces of different 3-D shapes and the faces of a single 3-D shape

❷ Features of Shapes Composing and decomposing 2-D and 3-D shapes

Math Focus Points

- Constructing 2-D shapes
- Finding combinations of shapes that fill an area
- Constructing 3-D shapes
- Combining 3-D shapes to make a given 3-D shape

This Unit also focuses on

- Exploring materials
- Relating 3-D objects to 2-D pictures of 3-D shapes
- Exploring Geoblocks and their attributes
- Matching a 3-D block to a 2-D outline of one of the block faces

Classroom Routines focus on

- Developing strategies for counting accurately
- Considering whether order matters when you count
- Comparing quantities
- Counting forward and backward
- Using the calendar as a tool for keeping track of time
- Collecting, counting, representing, describing, and comparing data
- Determining what comes next in a repeating pattern
- Describing repeating patterns

Assessed Benchmarks

- Describe the overall size, shape, function, and/or features of familiar 2-D and 3-D shapes
- Construct 2-D and 3-D shapes
- Make 2-D and 3-D shapes by combining shapes

How Many Do You Have? (Addition, Subtraction, and the Number System 3)

Mathematical Emphases

❶ Counting and Quantity Developing strategies for accurately counting a set of objects by ones

Math Focus Points

- Developing and analyzing visual images for quantities up to 10
- Developing strategies for accurately counting and keeping track of quantities up to 20
- Using subsets to count a set of objects
- Counting spaces and moving on a gameboard

❷ Whole-Number Operations Making sense of and developing strategies to solve addition and subtraction problems with small numbers

Math Focus Points

- Decomposing numbers in different ways
- Finding the total after 1, 2, or 3 is added to, or subtracted from, a set
- Combining two single-digit numbers, with totals to 20
- Modeling the action of combining and separating situations
- Separating one amount from another
- Developing strategies for solving addition and subtraction story problems
- Finding combinations of five and six
- Considering combinations of a number (e.g., 6 is 3 and 3 and also 5 and 1)

❸ Whole-Number Operations Using manipulatives, drawings, tools, and notation to show strategies and solutions

Math Focus Points

- Using numbers, and/or addition notation, to describe arrangements of objects, to record how many, and to represent an addition situation
- Using numbers, pictures, and/or words to represent a quantity, measurement, or a solution to a problem

This Unit also focuses on

- Creating an equivalent set
- Thinking strategically about moves on a gameboard
- Repeating multiple nonstandard units to quantify length
- Counting and comparing quantities to 20 to determine which is more
- Beginning to recognize that some problems have more than one solution

Classroom Routines focus on

- Developing strategies for counting accurately
- Considering whether order matters when you count
- Comparing quantities
- Counting forward and backward
- Using the calendar as a tool for keeping track of time
- Collecting, counting, representing, describing, and comparing data
- Determining what comes next in a repeating pattern
- Describing repeating patterns

Assessed Benchmarks

- Write the numbers up to 10
- Count a set of up to 20 objects
- Combine two small quantities

Sorting and Surveys (Data Analysis)

Mathematical Emphases

❶ Counting and Quantity Developing strategies for accurately counting a set of objects by ones

Math Focus Points

- Counting and keeping track of quantities
- Matching sets with a one-to-one correspondence
- Working with two-to-one correspondence
- Counting by groups of 2

❷ Data Analysis Representing data

Math Focus Points

- Making a representation of a set of data
- Seeing the one-to-one correspondence between a set of data and a representation of this data set

❸ Data Analysis Sorting and classifying

Math Focus Points

- Identifying the attributes of an object
- Identifying an attribute that is common to several objects
- Comparing how objects are the same and different
- Using attributes to sort a set of objects
- Grouping data into categories based on similar attributes
- Sorting a set of objects or data in different ways

❹ Data Analysis Carrying out a data investigation

Math Focus Points

- Choosing a survey question with two possible responses
- Collecting and keeping track of survey data
- Interpreting results of a data investigation
- Using data to solve a problem

This Unit also focuses on

- Comparing two quantities to determine which is more

Classroom Routines focus on

- Developing strategies for counting accurately
- Considering whether order matters when you count
- Comparing quantities
- Counting forward and backward
- Using the calendar as a tool for keeping track of time
- Collecting, counting, representing, describing, and comparing data
- Determining what comes next in a repeating pattern
- Describing repeating patterns

Assessed Benchmarks

- Represent a set of data
- Use data to solve a problem
- Sort a set of objects according to their attributes

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GRADE 1

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How Many Of Each? (Addition, Subtraction, and the Number System 1)

Mathematical Emphases

❶ Counting and Quantity Developing strategies for accurately counting a set of objects by ones

Math Focus Points

- Counting a set of up to 20 objects by ones
- Practicing the rote counting sequence forward and backward, from 1 to 30
- Connecting number names and written numbers to the quantities they represent
- Developing and analyzing visual images for quantities up to 10

❷ Counting and Quantity Developing an understanding of the magnitude and position of numbers

Math Focus Points

- Ordering a set of numbers and quantities up to 12
- Comparing two quantities up to 20 to see which is larger
- Developing an understanding of how the quantities in the counting sequence are related: each number is 1 more or 1 less than the number before or after it

❸ Number Composition Composing numbers up to 10 with 2 addends

Math Focus Points

- Finding and exploring relationships among combinations of numbers up to 10
- Recording combinations of two numbers that make a certain total
- Solving a problem with multiple solutions
- Solving a problem in which the total and one part are known

❹ Whole-Number Operations Making sense of and developing strategies to solve addition problems with small numbers

Math Focus Points

- Visualizing and retelling the action in an addition situation
- Modeling the action of an addition problem with counters or drawings
- Finding the total of two or more quantities up to a total of 20 by counting all, counting on, or using number combinations
- Seeing that adding the same two numbers (e.g., 4 and 3) results in the same total, regardless of context (e.g., number cubes, cards, objects)

❺ Whole-Number Operations Using manipulatives, drawings, tools, and notation to show strategies and solutions

Math Focus Points

- Using the number line as a tool for counting
- Introducing standard notation for comparing quantities (greater than, less than, and equal to)
- Introducing and using standard notation (1 and 5) to represent addition situations
- Recording a solution to a problem
- Representing number combinations with numbers, pictures, and/or words

This Unit also focuses on

- Exploring the characteristics of cubes, pattern blocks, Geoblocks, and Power Polygons

Classroom Routines focus on

- Developing strategies for counting accurately
- Using the calendar as a tool for keeping track of time
- Developing vocabulary to talk about time (morning, noon, midday, afternoon, etc.) and sequence (first, next, last, before, after, and so on)
- Collecting and recording data
- Estimating quantities up to about 30
- Adding or subtracting small amounts to/from a familiar number
- Connecting written numbers and number names
- Using the number line as a tool for counting
- Practicing the rote counting sequence forward and backward
- Developing and analyzing visual images for quantities up to 10
- Recreating an arrangement of objects
- Finding the total of two or more single-digit quantities

Assessed Benchmarks

- Count a set of up to 20 objects
- Compare and order quantities up to 12
- Combine two small quantities
- Interpret (retell the action and sequence) and solve addition story problems
- Find more than one combination of two addends for a number up to 10 (e.g., 7 is 4 and 3 and is also 5 and 2)

Making Shapes and Designing Quilts (2-D Geometry)

Mathematical Emphases

❶ Features of Shape Describing, identifying, and comparing 2-D shapes

Math Focus Points

- Noticing shapes in the environment
- Describing, comparing, and naming 2-D shapes
- Developing visual images of and language for describing 2-D shapes
- Identifying common attributes of a group of shapes
- Identifying characteristics of triangles and quadrilaterals
- Identifying and making triangles and quadrilaterals of different shapes and sizes
- Recognizing that there are many types of quadrilaterals (e.g., rectangles, trapezoids, squares, rhombi)

❷ Features of Shape Composing and decomposing 2-D shapes

Math Focus Points

- Covering a region without gaps or overlaps using multiple shapes
- Decomposing shapes in different ways
- Finding different combinations of shapes that fill the same area
- Examining how shapes can be combined to make other shapes
- Altering designs to use more or fewer pieces to cover the same space
- Seeing relationships between squares and triangles

This Unit also focuses on

- Counting a set of objects
- Finding the sum of multiple addends
- Using a repeated unit to create a pattern
- Seeing how changing the unit affects the whole pattern

Classroom Routines focus on

- Developing strategies for counting accurately
- Using the calendar as a tool for keeping track of time
- Developing vocabulary to talk about time (morning, noon, midday, afternoon, etc.) and sequence (first, next, last, before, after, during, and so on.)
- Collecting and recording data
- Estimating quantities up to about 30
- Adding or subtracting small amounts to/from a familiar number
- Connecting written numbers and number names
- Using the number line as a tool for counting
- Practicing the rote counting sequence forward and backward
- Identifying names and attributes of 2-D shapes

Assessed Benchmarks

- Fill a given region in different ways with a variety of shapes
- Use geometric language to describe and identify important features of familiar 2-D shapes
- Identify and describe triangles
- Describe and sort 2-D shapes
- Compose and decompose shapes

Solving Story Problems (Addition, Subtraction, and the Number System 2)

Mathematical Emphases

❶ Number Combinations Composing numbers up to 15 with two or more addends

Math Focus Points

- Finding as many 2-addend combinations of a number as possible
- Proving that all of the possible combinations have been found
- Solving a problem in which the total and one part are known
- Finding and exploring relationships among combinations of numbers up to 15
- Developing the strategy of counting on

❷ Whole-Number Operations Making sense of and developing strategies to solve addition and subtraction problems with small numbers

Math Focus Points

- Developing counting on as a strategy for combining two numbers
- Visualizing and retelling the action in addition and subtraction situations involving removal
- Finding the total of two or more quantities up to a total of 20 by counting all, counting on, or using number combinations
- Estimating whether an amount is more or less than a given quantity
- Modeling the action of an addition or subtraction (removal) problem with counters or drawings
- Subtracting one number from another, with initial totals of up to 12
- Developing strategies for solving addition and subtraction (removal) problems
- Seeing that subtracting the same two numbers (e.g., 6 from 10) results in the same difference regardless of context (e.g., number and dot cubes, cards, objects)

❸ Number Composition Representing numbers by using equivalent expressions

Math Focus Point

- Generating equivalent expressions for a number

❹ Counting and Quantity Developing strategies for accurately counting a set of objects by ones

Math Focus Points

- Practicing the rote counting sequence forward and backward, starting from any number 1–60
- Developing and analyzing visual images for quantities
- Accurately counting a set of objects by ones, up to 60
- Practicing the oral counting sequence from 1 to 100
- Writing the sequence of numbers (as high as students know)
- Identifying and using patterns in the sequence of numbers to 100

❺ Whole-Number Computation Using manipulatives, drawings, tools, and notation to show strategies and solutions

Math Focus Points

- Recording solutions to a problem
- Using numbers and standard notation (+, -, =) to record
- Connecting written numbers and standard notation (+, -, =) to the quantities and actions they represent
- Using the equal sign to show equivalent expressions
- Using the number line as a tool for counting
- Developing methods for recording addition and subtraction (removal) strategies
- Seeing the 100 chart as a representation of the counting numbers to 100

This Unit also focuses on

- Considering attributes that can be measured (i.e., length, perimeter, area)
- Measuring area by filling an outline with same-sized objects
- Recording, organizing, and interpreting numerical information
- Considering the relationship between the size of an object with the number of objects it takes to cover a shape

Classroom Routines focus on

- Using the calendar as a tool for keeping track of time
- Collecting and recording data
- Connecting written numbers and number names
- Using the number line as a tool for counting
- Practicing the forward and backward counting sequences with numbers up to 60
- Developing and analyzing visual images for quantities
- Recreating an arrangement of objects
- Finding the total of two or more single-digit quantities
- Exploring relationships among combinations
- Finding the total of two or more equal groups

Assessed Benchmarks

- Find at least five combinations of two addends for a number up to 15
- Combine two small quantities
- Interpret (retell the action and sequence) and solve addition and subtraction story problems
- Subtract one small quantity from another
- Represent numbers by using equivalent expressions
- Count a set of 40 to 50 objects
- Rote count, read, and write numbers to 65

What Would You Rather Be? (Data Analysis)

Mathematical Emphases

❶ Data Analysis Sorting and classifying

Math Focus Points

- Describing attributes of objects
- Using attributes to sort a set of objects
- Looking carefully at a group of objects to determine how they have been sorted

❷ Data Analysis Representing data

Math Focus Points

- Making a representation to communicate the results of a survey
- Making sense of data representations, including pictures, bar graphs, tallies, and Venn diagrams
- Comparing what different representations communicate about a set of data
- Using equations to show how the sum of the responses in each category equals the total responses collected
- Organizing data in numerical order

❸ Data Analysis Describing data

Math Focus Points

- Describing and comparing the number of pieces of data in each category or at each value and interpreting what the data tell you about the group
- Understanding that the sum of the pieces of data in all the categories equals the number of people surveyed
- Using data to compare how two groups are similar or different

❹ Data Analysis Designing and carrying out a data investigation

Math Focus Points

- Interpreting results of a data investigation
- Choosing a survey question
- Making a plan for gathering data
- Collecting and keeping track of survey data

Classroom Routines focus on

- Developing strategies for counting accurately
- Using the calendar as a tool for keeping track of time
- Developing vocabulary to talk about time (morning, noon, midday, afternoon, etc.) and sequence (first, next, last, before, after, etc.)
- Collecting and recording data
- Making sense of a variety of representations of data
- Connecting written numbers and number names
- Using the number line as a tool for counting
- Using the 100 chart as a tool for counting
- Practicing the forward and backward counting sequences with numbers up to 60
- Developing and analyzing visual images for quantities
- Identifying and naming coins

Assessed Benchmarks

- Sort a group of objects according to a given attribute
- Represent a set of data with two categories
- Interpret a variety of data representations with two categories
- Describe a set of data, including how many are in each group, which group is greater, and how many people responded to the survey

Fish Lengths and Animal Jumps (Measurement)

Mathematical Emphases

❶ Linear Measurement Understanding length

Math Focus Points

- Understanding what length is and how it can be measured
- Measuring lengths using different-sized units
- Identifying the longest dimension of an object
- Comparing lengths to determine which is longer
- Identifying contexts in which measurement is used
- Understanding the meaning of at least in the context of linear measurement

❷ Linear Measurement Using linear units

Math Focus Points

- Developing accurate measurement techniques
- Describing measurements that are in between whole numbers of units
- Understanding that measurements of the same length should be the same when they are measured twice or by different people using the same unit
- Understanding that measuring an object using different-length units will result in different measurements
- Measuring length by iterating a single unit

❸ Linear Measurement Measuring with standard units

Math Focus Point

- Using inch tiles to measure objects in inches

This Unit also focuses on

- Solving story problems about comparing lengths
- Classroom Routines focus on
- Developing strategies for counting accurately
- Using the calendar as a tool for keeping track of time
- Developing vocabulary to talk about time (morning, noon, midday, afternoon, etc.) and sequence (first, next, last, before, after, and so on)
- Collecting and recording data
- Connecting written numbers and number names
- Using the 100 chart as a tool for counting
- Practicing the forward and backward counting sequences with numbers up to 60
- Developing and analyzing visual images for quantities
- Identifying and naming coins
- Collecting, counting, representing, describing, and comparing data
- Interpreting different representations of data including: pictures, bar graphs, tallies, and Venn diagrams

Assessed Benchmarks

- Demonstrate accurate measuring techniques when measuring a distance with nonstandard or standard units. These techniques include starting at the beginning, ending at the end, leaving no gaps or overlaps, measuring in a straight line, and keeping track of the number of units.
- Know at least one way of describing a measurement that falls between two whole numbers
- Understand that the same results should be obtained when the same object is measured twice, or when two different people measure the same object (using the same unit)
- Understand that using different-sized units will result in different numbers

Number Games and Crayon Puzzles (Addition, Subtraction, and the Number System 3)

Mathematical Emphases

❶ Number Composition Composing numbers up to 20 with 2 or more addends

Math Focus Points

- Developing fluency with the 2-addend combinations of 10
- Finding relationships among different combinations of numbers up to 20
- Using 5 + 5 to reason about other combinations of 10
- Finding as many 2-addend combinations of a number as possible
- Trying to prove that all the possible 2-addend combinations of a number have been found

❷ Whole-Number Operations Making sense of and developing strategies to solve addition and subtraction problems with small numbers

Math Focus Points

- Solving related story problems
- Solving a problem in which the total and one part are known
- Adding 2 or more single-digit numbers
- Visualizing, retelling, and modeling the action in addition and subtraction (removal) situations
- Subtracting one number from another, with initial totals of up to 12
- Developing strategies for solving addition and subtraction story problems
- Solving addition and subtraction story problems

❸ Representing Mathematical Thinking Using manipulatives, drawings, tools, and notation to show strategies and solutions

Math Focus Points

- Using numbers and standard notation (+, -, =) to record
- Developing strategies for recording solutions to story problems

This Unit also focuses on

- Generating equivalent expressions for a number
- Develop strategies for counting and combining groups of dots
- Reasoning about more, less, and equal amounts
- Finding a solution that fits several clues

Classroom Routines focus on

- Developing strategies for counting accurately
- Using the calendar as a tool for keeping track of time
- Developing vocabulary to talk about time (morning, noon, midday, afternoon, etc.) and sequence (first, next, last, before, after, etc.)
- Collecting and recording data
- Estimating quantities up to about 30
- Adding or subtracting small amounts to/from a familiar number
- Investigating numbers that can (and cannot) be made into groups of two
- Counting, describing, and comparing data
- Making sense of a variety of representations of data
- Connecting written numbers and number names
- Using the 100 chart as a tool for counting
- Using the number line as a tool for counting
- Practicing the forward and backward counting sequences with numbers up to 100
- Developing and analyzing visual images for quantities
- Finding the total of two or more single-digit quantities
- Developing fluency with the addition combinations that make 10
- Using known combinations (i.e., combinations that make 10) to combine numbers
- Using standard notation (+, -, =) to write equations
- Collecting, counting, representing, describing, and comparing data
- Interpreting different representations of data including: pictures, bar graphs, tallies, and Venn Diagrams

Assessed Benchmarks

- Find at least five 2-addend combinations of 10
- Combine two small quantities by at least counting on
- Interpret (retell the action and sequence) and solve addition and subtraction story problems
- Subtract one small quantity from another

Color, Shape, and Number Patterns (Patterns and Functions)

Mathematical Emphases

❶ Repeating Patterns Constructing, describing, and extending repeating patterns

Math Focus Points

- Identifying what comes next in a repeating pattern
- Using the word pattern to describe some kind of regularity in a sequence

❷ Repeating Patterns Identifying the unit of a repeating pattern

Math Focus Points

- Representing a repeating unit in more than one way (for example, representing a red–blue–red–blue cube pattern with the movements clap–slap knees–clap–slap knees)
- Comparing repeating and nonrepeating sequences
- Describing a repeating pattern as a sequence built from a part that repeats over and over called the unit
- Identifying the unit of a repeating pattern
- Extending a repeating pattern by adding on units to the pattern
- Identifying what comes several steps beyond the visible part of a repeating pattern
- Comparing repeating patterns that have the same structure (for example, ABC), but different elements (for example, red–blue–green and yellow–orange–black)
- Comparing repeating patterns that have the same length of unit, but different structures (for example, red–blue–green and red–red–blue both have 3-element units)

❸ Number Sequences Constructing, describing, and extending number sequences with constant increments generated by various contexts

Math Focus Points

- Associating counting numbers with elements of a repeating pattern
- Determining the element of a repeating pattern associated with a particular counting number
- Determining and describing the number sequence associated with one of the elements in the unit of a repeating pattern (e.g., the numbers associated with B in an AB pattern are 2, 4, 6, 8 . . .)
- Modeling a constant rate of increase with concrete materials
- Describing how a number sequence represents a situation with a constant rate of change
- Extending a number sequence associated with a situation with a constant rate of change
- Determining how and why the same number sequences can be generated by different contexts

Classroom Routines focus on

- Developing strategies for counting accurately
- Using the calendar as a tool for keeping track of time
- Developing vocabulary to talk about time (morning, noon, midday, afternoon, etc.) and sequence (first, next, last, before, after, etc.)
- Collecting and recording data
- Naming and telling time to the hour on digital and analog clocks
- Associating times on the hour with daily events
- Connecting written numbers and number names
- Using the 100 chart as a tool for counting
- Using the number line as a tool for counting
- Practicing the forward and backward counting sequences with numbers up to 100
- Connecting standard notation (+, -, =) to the actions and relationships they represent
- Creating a story problem for a given expression
- Developing strategies for adding and subtracting small numbers
- Solving related problems
- Collecting, counting, representing, describing, and comparing data
- Interpreting different representations of data including: pictures, bar graphs, tallies, and Venn diagrams

Assessed Benchmarks

- Construct, describe, and extend a repeating pattern with the structure AB, ABC, AAB, or ABB
- Identify the unit of a repeating pattern for patterns with the structure AB or ABC
- Describe how various AB or ABC patterns are alike (e.g., How is a red-blue pattern like a yellow-green pattern?)
- Determine what comes several steps beyond the visible part of an AB, ABC, AAB, or ABB repeating pattern
- Construct, extend, and describe a pattern that has a constant increase for the sequences 1, 3, 5, ...; 2, 4, 6, ...; 1, 4, 7, ...; 2, 5, 8, ...; and 3, 6, 9, ... through counting and building

Twos, Fives, and Tens (Addition, Subtraction, and the Number System 4)

Mathematical Emphases

❶ Counting and Quantity Developing strategies for accurately counting a set of objects by ones and by groups

Math Focus Points

- Counting and keeping track of amounts up to 60
- Counting on from a known quantity
- Organizing objects to count them more efficiently
- Identifying and using patterns in the number sequence and on the 100 chart
- Identifying, reading, writing, and sequencing numbers to 100 and beyond
- Counting and combining things that come in groups of 1, 2, 4, 5, and 10
- Counting by 2s, 5s, and 10s
- Exploring a 2:1 (the number of hands in a group of people) and a 5:1 relationship (the number of fingers and hands in a group)
- Counting by numbers other than 1
- Developing strategies for organizing sets of objects so that they are easy to count and combine
- Developing meaning for counting by groups of 10

❷ Whole-Number Operations Using manipulatives, drawings, tools, and notation to show strategies and solutions

Math Focus Points

- Using addition notation (+, =) to record
- Recording strategies for counting and combining
- Considering notation for equivalent expressions (e.g., $7 + 8 = 10 + 5$)

❸ Computational Fluency Knowing addition combinations of 10

Math Focus Points

- Developing fluency with the 2-addend combinations of 10
- Solving a problem in which the total (10) and one part are known

This Unit also focuses on

- Adding single-digit numbers
- Thinking about numbers to 20 in terms of how they relate to 10 (e.g., $10 + \_\_$ or < 10)
- Determining equivalent expressions for a given expression (e.g., $7 + 8 = 10 + \_\_$)
- Considering a 2-digit number as tens and ones

Classroom Routines focus on

- Developing strategies for counting accurately
- Using the calendar as a tool for keeping track of time
- Developing vocabulary to talk about time (morning, noon, midday, afternoon, etc.) and sequence (first, next, last, before, after, etc.)
- Collecting and recording data
- Naming and telling time to the hour on digital and analog clocks
- Associating times on the hour with daily events
- Connecting written numbers and number names
- Using the 100 chart as a tool for counting
- Using the number line as a tool for counting
- Practicing the forward and backward counting sequences with numbers up to 100
- Counting by 5s and 10s
- Connecting standard notation (+, -, =) to the actions and relationships they represent
- Creating a story problem for a given expression
- Developing strategies for adding and subtracting small numbers
- Solving related problems
- Developing and analyzing visual images for quantities
- Finding the total of two or more single-digit quantities

Assessed Benchmarks

- Identify, read, write, and sequence numbers to 105
- Begin to count by groups in meaningful ways
- Gain fluency with the 2-addend combinations of 10

Blocks and Books (3-D Geometry)

Mathematical Emphases

❶ Features of Shape Describing and comparing 2-D and 3-D shapes

Math Focus Points

- Developing vocabulary to describe 3-D shapes and their attributes
- Comparing size, shape, and orientation of objects
- Identifying the characteristics of 3-D objects by touch
- Describing a rectangular prism
- Comparing rectangular prisms
- Observing and describing characteristics of 3-D shapes
- Recognizing shapes in the world
- Describing 3-D structures

❷ Features of Shape Exploring the relationships between 2-D and 3-D shapes

Math Focus Points

- Matching a 3-D object to a 2-D outline of one of its faces
- Matching a 3-D object to a 2-D picture of the object
- Making 3-D objects out of 2-D pieces
- Making a 2-D representation of a 3-D object or structure
- Building a 3-D construction from a 2-D representation

This Unit also focuses on

- Relating the size and shape of an object to its use
- Planning a geometric structure with limited space and materials
- Visualizing and estimating the paces and turns required to follow a particular path
- Giving, following, and recording directions for following a path
- Counting and adding to compare the distances of different paths

Classroom Routines focus on

- Developing strategies for counting accurately
- Using the calendar as a tool for keeping track of time
- Developing vocabulary to talk about time (morning, noon, midday, afternoon, and so on) and sequence (first, next, last, before, after, and so on)
- Collecting and recording data
- Counting, describing, and comparing data
- Estimating quantities up to about 30
- Adding or subtracting small amounts to/from a familiar number
- Investigating numbers that can (and cannot) be made into groups of two
- Making sense of a variety of representations of data
- Naming and telling time to the hour on digital and analog clocks
- Associating times on the hour with daily events
- Developing visual images of, and language for describing, 2-D shapes
- Identifying names and attributes of 2-D shapes
- Collecting, counting, representing, describing, and comparing data
- Interpreting different representations of data, including pictures, bar graphs, tallies, and Venn diagrams
- Connecting standard notation (+, -, =) to the actions and relationships they represent
- Creating a story problem for a given expression
- Developing strategies for adding and subtracting small numbers
- Solving related problems

Assessed Benchmarks

- Attend to features of 3-D shapes, such as overall size and shape, the number and shape of faces, and the number of corners
- Match a 2-D representation to a 3-D shape or structure

Content Scope & Sequence

GRADE 2

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Counting, Coins, and Combinations (Addition, Subtraction, and the Number System 1)

Mathematical Emphases

❶ Counting and Quantity Developing strategies for accurately counting a set of objects by ones and groups

Math Focus Points
- Counting sets of up to 60 objects
- Developing strategies for counting accurately
- Counting a quantity in more than one way
- Developing and analyzing visual images for quantities up to 10
- Counting by groups of 10

❷ Counting and Quantity Developing an understanding of the magnitude and sequence of numbers up to 100

Math Focus Points
- Using the number line to reason about, and keep track of information about, the magnitude and relationship of numbers
- Developing an understanding of the structure of the 100 chart
- Counting, writing, and reading numbers sequentially from 1 to 100 and beyond
- Identifying and using patterns in the structure of the number system

❸ Whole-Number Operations Making sense of and developing strategies to solve addition and subtraction problems with totals up to 45

Math Focus Points
- Generating equivalent expressions for a number
- Comparing two amounts under 45 to find the difference
- Combining two quantities with totals up to 45
- Visualizing, retelling, and modeling the action of addition and subtraction (as removal) situations
- Using known combinations (e.g., combinations that make 10) to compose, decompose, and combine numbers
- Subtracting a quantity from a whole of up to 30
- Solving addition and subtraction (as removal) story problems
- Doubling a quantity

❹ Computational Fluency Knowing addition combinations to 10 + 10

Math Focus Points
- Developing fluency with the Make 10, Plus 1, and Plus 2 addition combinations
- Finding two addends that make 10
- Finding the missing addend to make a total of 10
- Doubling a quantity
- Developing fluency with the doubles combinations

❺ Whole-Number Operations Using manipulatives, drawings, tools, and notation to show strategies and solutions

Math Focus Points
- Establishing use of tools, routines, and expectations for math class
- Using standard notation (>, <, +, -, =) to describe arrangements of cubes, to record expressions that equal a given number, to compare quantities, to represent addition and subtraction situations, and to represent doubling
- Using the number line to reason about, and keep track of information about, the magnitude and relationship of numbers
- Recording strategies for solving problems, including addition and subtraction story problems
- Using equations to record
- Connecting standard notation for addition and subtraction (+, -, =) to the quantities and actions that the signs and symbols represent
- Using a rectangular array to model doubling

This Unit also focuses on
- Fitting shapes together to cover an area
- Identifying coins and their values
- Identifying how many pennies each coin is worth
- Identifying and using coin equivalencies
- Collecting, counting, representing, discussing, interpreting, and comparing data
- Making predictions about data

Classroom Routines focus on
- Using clocks as tools for keeping track of and measuring time
- Naming, notating, and telling time to the hour, half hour, and quarter hour on digital and analog clocks
- Associating times on the hour and half hour with daily events
- Determining what time it will be when given start and elapsed times that are multiples of 15 minutes
- Seeing a timeline as a representation of events over time
- Using a timeline to keep track of and compare time and events
- Determining the length of a given interval (e.g., 8:30 to 9:30) or activity (e.g., math class)
- Solving problems involving elapsed time
- Generating equivalent expressions for a number
- Developing fluency with addition and subtraction
- Using standard notation (+, -, =) to record expressions and write equations
- Developing and analyzing visual images for quantities up to 10
- Developing fluency with the combinations that make 10
- Developing fluency with the addition combinations to 10 + 10
- Using known combinations (e.g., combinations that make 10) to combine numbers
- Recreating images of dots arranged in 2-by-5 arrays

Assessed Benchmarks

- Count a set of objects up to 60 in at least one way
- Determine the difference between two numbers (up to 45)
- Interpret addition and subtraction story problems (read a story problem and determine what needs to be figured out)
- Have at least one strategy for solving addition and subtraction (as removal) story problems
- Demonstrate fluency with the Plus 1, Plus 2, and Make 10 addition combinations
- Understand what it means to double a quantity

Shapes, Blocks, and Symmetry (2-D and 3-D Geometry)

Mathematical Emphases

❶ Features of Shape Composing and decomposing 2-D and 3-D shapes

Math Focus Points

- Combining shapes to make a new shape
- Covering a region, without gaps or overlaps, with a single shape or multiple shapes
- Covering a region, without gaps or overlaps, using different shapes
- Combining 3-D shapes to make a 3-D whole
- Drawing 3-D shapes

❷ Features of Shape Describing, identifying, comparing, and sorting 2-D and 3-D shapes

Math Focus Points

- Describing attributes of and sorting 2-D and 3-D shapes
- Identifying names and attributes of 2-D and 3-D shapes
- Attending to features of 3-D shapes, particularly the number and shape of faces
- Identifying categories for 2-D shapes
- Identifying a 3-D shape by touch
- Sorting polygons by the number of sides
- Sorting quadrilaterals by angle
- Identifying quadrilaterals as shapes with 4 sides
- Identifying rectangles as 4-sided shapes with 4 right angles
- Identifying important features of a rectangle
- Defining biggest in different ways
- Ordering rectangles from biggest to smallest
- Recognizing that rectangular prisms have rectangular faces
- Recognizing which faces of a rectangular prism are the same size and shape
- Constructing a rectangular prism from rectangles
- Visualizing and describing rectangular prisms
- Comparing rectangular prisms

❸ Area Measurement Visualizing the structure of arrays

Math Focus Points

- Covering rectangles with arrays of tiles
- Arranging square tiles in rectangular arrays
- Constructing and describing rectangular arrays of tiles
- Making different rectangular arrays using the same number of tiles
- Drawing rectangles by attending to the lengths of the sides

❹ Features of Shape Exploring mirror symmetry

Math Focus Points

- Describing and identifying objects and designs that have mirror symmetry
- Constructing 2-D and 3-D symmetrical designs with mirror symmetry
- Reflecting a shape across a line of symmetry
- Exploring symmetry by folding and cutting paper patterns
- Identifying lines of symmetry
- Orienting shapes so that a line of symmetry aligns with a mirror (Shapes software)
- Determining what makes a design symmetrical

❺ Computational Fluency Knowing addition combinations to 10 + 10

Math Focus Points

- Reviewing known addition combinations (combinations of 10, Plus 1, Plus 2)
- Developing fluency with the doubles combinations to 10 + 10
- Achieving fluency with the doubles combinations

Classroom Routines focus on

- Generating equivalent expressions for a number
- Developing fluency with addition and subtraction
- Using standard notation (+, -, =) to record expressions and write equations
- Using clocks as tools for keeping track of and measuring time
- Naming, notating, and telling time to the hour, half hour, and quarter hour on digital and analog clocks
- Associating times on the hour and half hour with daily events
- Developing and analyzing visual images for quantities
- Identifying names and attributes of 2-D shapes
- Developing fluency with the doubles combinations up to 10 + 10
- Using arrays and standard notation (+, =) to represent doubles to 10 + 10
- Making predictions about data
- Collecting, counting, representing, discussing, interpreting, and comparing data
- Counting by groups
- Counting a quantity in more than one way

Assessed Benchmarks

- Identify the number of sides of a polygon
- Identify the number of rows and the number of squares in each row in an array
- Identify rectangles as four-sided shapes with four right angles
- Identify the number of faces on a rectangular prism and show which faces are congruent
- Make a symmetrical picture based on an image provided
- Demonstrate fluency with addition combinations: doubles combinations to 10 + 10

Stickers, Number Strings, and Story Problems (Addition, Subtraction, and the Number System 2)

Mathematical Emphases

❶ Whole-Number Operations Making sense of and developing strategies to solve addition and subtraction problems with totals up to 45

Math Focus Points
- Using known combinations to add two or more numbers
- Comparing a number to 20 to find the difference
- Visualizing, retelling, and modeling the action of a variety of addition and subtraction situations
- Developing strategies for solving a variety of addition and subtraction story problems with totals up to 45 and recording work
- Solving problems with an unknown change
- Combining coins to a total of 50¢
- Solving an addition story problem by counting on or breaking numbers apart

❷ Whole-Number Operations Understanding the properties of addition and subtraction

Math Focus Points
- Considering whether reordering three addends results in the same total
- Considering a generalization about reordering addends for all numbers
- Considering whether reordering the numbers in a subtraction problem results in the same total
- Considering the relationship between addition and subtraction

❸ Counting and Quantity Counting by equal groups

Math Focus Points
- Investigating numbers that can and cannot be made into groups of two or two equal groups
- Understanding that any number that can be divided into groups of two can also be divided into two equal groups (and vice versa)
- Characterizing even and odd numbers as those that do or do not make groups of two (partners) and two equal groups (teams)
- Considering whether observations about even or odd numbers apply to all even numbers or all odd numbers

❹ Counting and Quantity Developing strategies for accurately counting a set of objects by ones and groups

Math Focus Points
- Looking at patterns and developing fluency with skip counting by 2s, 5s, and 10s
- Considering the relationship between skip counting and grouping
- Counting by groups of 2, 5, and 10
- Noticing and describing a 2:1 relationship (e.g., there are 2 legs for every 1 person)
- Solving problems that involve equal groups
- Knowing that the size of a group remains constant no matter how it is counted (by 1s, 2s, 5s, or 10s)

❺ The Base-Ten Number System Understanding the equivalence of one group and the discrete units that comprise it

Math Focus Points
- Identifying coins and their values
- Identifying and using coin equivalencies
- Recognizing that the first digit of a 2-digit number designates the number of groups of 10 and the second digit designates the number of ones
- Solving problems about 10s and 1s
- Using a place-value model to represent a number as 10s and 1s
- Finding as many combinations of a number as possible, using only 10s and 1s
- Recognizing that different combinations of 10s and 1s for the same number are equivalent (e.g., 4 tens and 6 ones = 3 tens and 16 ones, etc.)

❻ Whole-Number Computation Using manipulatives, drawings, tools, and notation to show strategies and solutions

Math Focus Points
- Using the calculator as a mathematical tool
- Using standard notation (+, -, =) to represent a variety of addition and subtraction situations
- Telling stories to match given equations
- Using tally marks to represent groups of 5

❼ Computational Fluency Knowing addition combinations to 10 + 10

Math Focus Points
- Relating the doubles and near-doubles combinations
- Developing fluency with the near-doubles combinations
- Adding 10 to any number (or any number to 10)
- Developing fluency with the Plus 10 combinations
- Achieving fluency with the near-doubles combinations

Classroom Routines focus on
- Generating equivalent expressions for a number
- Developing fluency with addition and subtraction
- Using standard notation (+, -, =) to record expressions and write equations
- Skip counting by 2s, 5s, and 10s
- Identifying patterns in the multiples of 2, 5, and 10
- Developing fluency with the addition combinations to 10 + 10
- Using known combinations (i.e., combinations that make 10) to combine numbers
- Recreating images of dots arranged in 2-by-5 arrays
- Using standard notation (+, -, =) to write equations
- Making predictions about data
- Collecting, counting, representing, discussing, interpreting, and comparing data
- Counting by groups
- Counting a quantity in more than one way
- Using known combinations (i.e., combinations that make 10) to combine numbers
- Developing strategies for solving addition problems with many addends
- Using a place-value model to represent a number as 10s and 1s
- Recognizing that the first digit of a 2-digit number designates the number of groups of 10 and the second digit designates the number of ones
- Using clocks as tools for keeping track of and measuring time
- Naming, notating, and telling time to the hour, half hour, and quarter hour on digital and analog clocks
- Associating times on the hour and half hour with daily events
- Determining what time it will be when given start and elapsed times that are multiples of 15 minutes
- Determining the number of minutes in hours, half hours, and quarter hours
- Counting by 5s

Assessed Benchmarks

- Use known combinations to add several numbers in any order
- Interpret and solve subtraction (removal) and unknown change story problems with totals up to 45
- Define even and odd numbers in terms of groups of two or two equal groups
- Recognize and identify coins and their value
- Count on or break apart numbers to add two or more numbers up to a total of 45
- Interpret and solve problems about the number of tens and ones in a quantity
- Demonstrate fluency with addition combinations: near-doubles

Pockets, Teeth, and Favorite Things (Data Analysis)

Mathematical Emphases

❶ Data Analysis Sorting and classifying data

Math Focus Points

- Grouping data into categories based on similar attributes
- Sorting the same set of data in different ways
- Sorting a set of data by two attributes at one time

❷ Data Analysis Representing data

Math Focus Points

- Representing a set of data sorted into categories
- Comparing representations of a set of data
- Using equations to show how the sum of the responses in each category equals the total responses collected
- Using a Venn diagram to represent a sorted set of data
- Ordering, representing, and describing a set of numerical data
- Comparing ways of organizing data
- Representing data on a line plot

❸ Data Analysis Describing data

Math Focus Points

- Describing what the data show about the group surveyed
- Interpreting a data representation including a line plot
- Describing important features of a data set
- Describing a set of numerical data
- Comparing two sets of data
- Developing a hypothesis based on a set of data

❹ Data Analysis Designing and carrying out a data investigation

Math Focus Points

- Choosing a survey question
- Making a plan for collecting data
- Making predictions about data to be collected
- Collecting and recording data from a survey
- Interpreting and sharing results from a data investigation

This Unit also focuses on

- Developing strategies for combining multiple addends
- Achieving fluency with the Plus 10 combinations

Classroom Routines focus on

- Generating equivalent expressions for a number
- Developing fluency with addition and subtraction
- Using standard notation (+, -, =) to record expressions and write equations
- Using clocks as tools for keeping track of and measuring time
- Naming, notating, and telling time to the hour, half hour, and quarter hour on digital and analog clocks
- Determining what time it will be when given start and elapsed times that are multiples of 15 minutes
- Determining the number of minutes in hours, half hours, and quarter hours
- Developing and analyzing visual images for quantities
- Combining groups of tens and ones
- Adding to or subtracting 10 from a 2-digit number
- Noticing what happens to the tens place when a multiple of 10 is added to or subtracted from a 2-digit number
- Identifying coins and their values
- Adding coin amounts
- Using standard notation (¢, +, -, =) to write equations

Assessed Benchmarks

- Use a Venn diagram to sort data by two attributes
- Identify categories for a set of categorical data and organize the data into chosen categories
- Order and represent a set of numerical data
- Describe a numerical data set, including the highest and lowest values and the mode
- Read and interpret a variety of representations of numerical and categorical data
- Compare two sets of numerical data
- Demonstrate fluency with Plus 10 combinations

How Many Floors? How Many Rooms? (Patterns, Functions, and Change)

Mathematical Emphases

❶ Linear Relationships Describing and representing ratios

Math Focus Points

- Describing the relationship between two quantities in a constant ratio situation
- Using tables to represent the ratio relationship between two quantities
- Finding the value of one quantity in a constant ratio situation, given the value of the other

❷ Using Tables and Graphs Using tables to represent change

Math Focus Points

- Connecting numbers in a table to the situation they represent
- Using conventional language for a table and its parts: rows, columns
- Describing the pattern in the numbers in a column and interpreting the pattern in terms of the situation the table represents
- Describing what is the same about situations that look different but can be represented by the same table
- Describing how the two numbers in the row of a table are connected to the situation the table represents
- Using information in a table to determine the relationship between two quantities

❸ Number Sequences Constructing, describing, and extending number sequences with constant increments generated by various contexts

Math Focus Points

- Extending a repeating pattern
- Identifying the unit of a repeating pattern
- Creating a repeating pattern that has the same structure as, but different elements than, another repeating pattern (e.g., a red–blue pattern and a clap–tap head pattern)
- Defining even and odd numbers
- Determining and describing the number sequence associated with one of the elements in an AB, ABC, ABCD, or AABBC repeating pattern (e.g., 2, 4, 6, 8, . . .; 3, 6, 9, . . . ; 1, 4, 7, . . .)
- Determining the element of a repeating pattern associated with a particular counting number in AB, ABC, ABCD, or AABBC patterns (e.g., what color is the 8th element in a red–blue repeating pattern?)
- Determining how and why the same number sequence can be generated by different contexts

This Unit also focuses on

- Counting by and adding equal groups, such as 2s and 5s

Classroom Routines focus on

- Generating equivalent expressions for a number
- Developing fluency with addition and subtraction
- Using standard notation (+, -, =) to record expressions and write equations
- Using clocks as tools for keeping track of and measuring time
- Naming, notating, and telling time to the hour, half hour, and quarter hour on digital and analog clocks
- Determining what time it will be when given start and elapsed times that are multiples of 15 minutes
- Developing and analyzing visual images for quantities
- Combining groups of 10s and 1s
- Identifying coins and their values
- Adding coin amounts
- Using standard notation (¢, +, =) to write equations
- Using ratio relationships to solve problems
- Making estimates based on data collected over time
- Collecting, counting, representing, discussing, interpreting, and comparing data
- Counting by groups
- Counting a quantity in more than one way
- Using known combinations (e.g., combinations that make 10) to combine numbers
- Developing strategies for solving addition problems with many addends
- Using a place value model to represent a number as 10s and 1s
- Recognizing that the first digit of a 2-digit number designates the number of groups of 10 and the second digit designates the number of ones

Assessed Benchmarks

- Explain what the numbers in a table represent in a constant ratio situation (involving ratios of 1:2, 1:3, 1:4, 1:5, and 1:6)
- Complete and extend a table to match a situation involving a constant ratio
- Extend a repeating pattern and determine what element of the pattern will be in a particular position (e.g., the 16th position) if the pattern keeps going

How Many Tens? How Many Ones? (Addition, Subtraction, and the Number System 3)

Mathematical Emphases

❶ Whole-Number Operation Making sense of and developing strategies to solve addition and subtraction problems with totals up to 100

Math Focus Points

- Developing efficient methods for adding and subtracting 2-digit numbers
- Adding tens and ones to combine 2-digit numbers
- Noticing what happens to the tens place when a multiple of 10 is added or subtracted
- Adding 2-digit numbers by keeping one number whole
- Naming and comparing strategies for adding and subtracting 2-digit numbers
- Determining the difference between a number and a multiple of 10 up to 100
- Adding 2-digit numbers
- Adding multiples of 5 and 10, up to 100
- Adding coin amounts, up to $1.00
- Determining the difference between a given amount and $1.00
- Adding and subtracting 10 and multiples of 10 to/from any number
- Subtracting amounts from 100 or $1.00, down to 0

❷ Counting and Quantity Developing an understanding of the magnitude and sequence of numbers up to 100

Math Focus Points

- Becoming familiar with the structure of the 100 chart
- Developing fluency with the sequence of numbers from 1 to 100
- Finding and using patterns in the sequence of numbers
- Using the 100 chart to reason about, and keep track of, information about the magnitude and relationship of numbers

❸ Counting and Quantity Counting by equal groups

Math Focus Points

- Skip counting by 2s, 5s, and 10s
- Thinking about the structure of 100 in terms of groups of 5 and 10
- Identifying patterns in the multiples of 2, 5, and 10
- Using the relationship between 5 and 10, and between nickels and dimes, to solve problems

❹ The Base-Ten Number System Understanding the equivalence of one group and the discreteunits that comprise it

Math Focus Points

- Organizing cubes into 10s and 1s
- Using a place-value model to represent a number as 10s and 1s
- Using coin equivalencies
- Working with the relationship between 1, 10, and 100

❺ Whole-Number Computation Using manipulatives, drawings, tools, and notation to show strategies and solutions

Math Focus Points

- Writing an equation that represents a problem
- Developing efficient methods for notating addition and subtraction strategies
- Visualizing and making jumps of multiples of 5 on the 100 chart
- Using coins to model adding by 5s and 10s
- Using the 100 chart and the number line to model addition

Classroom Routines focus on

- Using clocks as tools for keeping track of and measuring time
- Naming, notating, and telling time to the hour, half hour, and quarter hour on digital and analog clocks
- Determining the number of minutes in hours, half hours, and quarter hours
- Counting by 5s
- Determining what time it will be when given start and elapsed times that are multiples of 15 minutes
- Generating equivalent expressions for a number
- Developing fluency with addition and subtraction
- Using standard notation (+, -, =) to record expressions and write equations
- Skip counting by 2s, 5s, and 10s
- Identifying patterns in the multiples of 2, 5, and 10
- Making estimates based on data collected over time
- Collecting, counting, representing, discussing, interpreting, and comparing data
- Counting by groups
- Counting a quantity in more than one way
- Identifying coins and their values
- Identifying and using coin equivalencies
- Using a place-value model to represent a number as 10s and 1s
- Recognizing that the first digit of a 2-digit number designates the number of groups of 10 and the second digit designates the number of ones
- Developing and analyzing visual images for quantities
- Using ratio relationships to solve problems
- Adding coin amounts

Assessed Benchmarks

- Write an equation that represents an addition or subtraction situation
- Determine the difference between a number and any multiple of 10, up to 100
- Count by 2s, 5s, and 10s, up to 110
- Add multiples of 5, up to 100
- Know coin equivalencies for nickel, dime, and quarter

Parts of a Whole, Parts of a Group (Fractions)

Mathematical Emphases

❶ Rational Numbers Understanding fractions as equal parts of a whole

Math Focus Points

- Finding equal parts of a whole and naming them with fractions (e.g., ½ is one of two equal parts; ⅓ is one of three equal parts, and so on)
- Showing one half of an object
- Determining whether a block is half of another block
- Determining whether a region is half of a given rectangle
- Seeing different ways to make fourths of a square
- Recognizing the equivalence of different fourths of the same object
- Identifying halves, thirds, and fourths of regions
- Identifying and naming fractional parts that have numerators greater than 1 (e.g., ⅔, ²/₄, ¾)

❷ Rational Numbers Understanding fractions as equal parts of a group

Math Focus Points

- Finding equal parts of a group and naming them with fractions (e.g., ½ is one of two equal parts; ⅓ is one of three equal parts, and so on
- Finding one half of a set
- Solving problems about finding halves of quantities in different contexts
- Solving problems that result in mixed numbers
- Finding thirds and fourths of sets
- Finding fractions of sets

❸ Rational Numbers Using terms and notation

Math Focus Points

- Learning the term one half and the notation ½
- Learning the terms and notation for mixed numbers (e.g., one and a half and 1½)
- Learning the term one fourth and the notation ¼
- Learning the term one third and the notation ⅓
- Learning the terms and notation for fractions that contain more than one part (e.g., ⅔, ²/₄, and ¾)

Classroom Routines focus on

- Developing and analyzing visual images for quantities
- Combining groups of tens and ones
- Generating equivalent expressions for a number
- Developing fluency with addition and subtraction
- Using standard notation (+, -, =) to record expressions and write equations
- Using clocks as tools for keeping track of and measuring time
- Naming, notating, and telling time to the hour, half hour, and quarter hour on digital and analog clocks
- Determining the number of minutes in hours, half hours, and quarter hours
- Counting by 5s
- Making predictions about data
- Collecting, counting, representing, discussing, interpreting, and comparing data
- Using known combinations (i.e., combinations that make 10) to combine numbers
- Developing strategies for solving addition problems with many addends

Assessed Benchmarks

- Identify ½, ⅓, and ¼ of a region
- Find ½ of a set of objects
- Recognize that a fraction divides the whole into equal parts

Partners, Teams, and Paper Clips (Addition, Subtraction, and the Number System 4)

Mathematical Emphases

❶ Whole-Number Operations Adding even and odd numbers

Math Focus Points

- Characterizing even and odd numbers as those that do or do not make groups of two (partners) and two equal groups (teams)
- Investigating what happens with partners and teams when two groups are combined
- Making and testing conjectures about adding even and odd numbers
- Finding combinations of odd and even numbers that make given numbers or determining that these combinations are not possible
- Making and justifying generalizations about adding even and odd numbers

❷ Computational Fluency Knowing addition combinations to 10 + 10

Math Focus Points

- Relating unknown combinations to known combinations
- Developing and achieving fluency with the plus 9 and remaining combinations

❸ Whole-Number Operations Making sense of and developing strategies to solve addition and subtraction problems with totals to 100

Math Focus Points

- Subtracting amounts from 100
- Visualizing, retelling, and modeling the action of addition and subtraction situations
- Developing efficient methods for adding, subtracting, and notating strategies
- Solving subtraction problems by subtracting in parts
- Solving subtraction problems by adding up or subtracting back to find the difference
- Comparing problems in which the amount subtracted differs by 1
- Adding 2-digit numbers by keeping one number whole
- Adding 2-digit numbers by adding tens and ones
- Noticing what happens to place value when two 2-digit numbers with a sum over 100 are combined

❹ Whole-Number Computation Using manipulatives, drawings, tools, and notation to show strategies and solutions

Math Focus Points

- Using cubes and the number line to show how addition combinations are related
- Representing the action of subtraction and addition situations using notation (-, +, =)

This Unit also focuses on

- Counting a set of objects by equal groups
- Thinking about what happens if you subtract 1 more or 1 less

Classroom Routines focus on

- Generating equivalent expressions for a number
- Developing fluency with addition and subtraction
- Using standard notation (+, -, =) to record expressions and write equations
- Using clocks as tools for keeping track of and measuring time
- Naming, notating, and telling time to the hour, half hour, and quarter hour on digital and analog clocks
- Determining what time it will be when given start and elapsed times that are multiples of 15 minutes
- Developing and analyzing visual images for quantities
- Solving problems about an unknown change
- Adding or subtracting 10
- Noticing what happens to the tens place when a multiple of 10 is added or subtracted
- Making predictions about data
- Collecting, counting, representing, discussing, interpreting, and comparing data
- Counting by groups
- Counting a quantity in more than one way
- Developing strategies for solving addition problems with many addends

Assessed Benchmarks

- Subtract 2-digit numbers
- Reason about partners, teams, and leftovers to make and justify generalizations about what happens when even and odd numbers are added
- Add two 2-digit numbers accurately and efficiently
- Demonstrate fluency with addition combinations: plus 9 and remaining combinations

Measuring Length and Time (Measurement)

Mathematical Emphases

❶ Linear Measurement Understanding length

Math Focus Points

- Comparing two lengths
- Using direct and indirect comparison to identify equal lengths
- Identifying length and width as different dimensions of an object

❷ Linear Measurement Using linear units

Math Focus Points

- Iterating units to measure length
- Estimating and calculating length using units that are related by a 2:1 ratio
- Identifying strategies for accurate measurement
- Considering sources of measurement error
- Understanding that different-sized units yield different counts (the smaller the unit, the higher the count)
- Establishing the need for and using a common unit in order to compare measurements
- Identifying and labeling partial units
- Recognizing that, given equal counts of two different units, the larger unit marks off a longer length

❸ Linear Measurement Measuring with standard units

Math Focus Points

- Establishing the need for and using a standard unit of measure
- Creating and using a 12-inch measuring tool
- Iterating a 12-inch measuring tool
- Measuring lengths that are longer than 12 inches
- Using a ruler as a standard measuring tool
- Comparing a variety of measuring tools
- Becoming familiar with the terms inches, feet, yards, centimeters, and meters as standard units of measure
- Using inches, feet, yards, centimeters, and meters to describe lengths
- Comparing centimeters and inches

❹ Time Representing time and calculating duration

Math Focus Points

- Representing time as a horizontal sequence
- Connecting a time, its digital notation, and its representation on an analog clock to a timeline
- Naming and using notation for times that are 30 and 15 minutes before or after the hour
- Associating times with daily events
- Using a timeline to determine duration
- Moving forward and backward along a timeline in multiples of hours, half hours, and quarter hours
- Using a timeline to show a 24-hour period
- Recording events on a timeline

This Unit also focuses on

- Solving comparison problems by finding the difference between two measurements

Classroom Routines focus on

- Developing and analyzing visual images for quantities
- Combining groups of 10s and 1s
- Using standard notation (+, -, =) to write equations
- Generating equivalent expressions for a number
- Developing fluency with addition and subtraction
- Using standard notation (+, -, =) to record expressions and write equations
- Making predictions about data
- Collecting, counting, representing, discussing, interpreting, and comparing data
- Counting by groups
- Developing strategies for solving addition problems with many addends
- Using known combinations (i.e., combinations that make 10) to combine numbers
- Using a place value model to represent a number as 10s and 1s
- Using clocks as tools for keeping track of and measuring time
- Naming, notating and telling time to the hour, half hour, and quarter hour on digital and analog clocks
- Associating times on the hour and half hour with daily events
- Determining what time it will be when given start and elapsed times that are multiples of 15 minutes
- Seeing a timeline as a representation of events over time
- Using a timeline to keep track of and compare time and events
- Determining the length of a given interval (e.g., 8:30 to 9:30) or activity (e.g., math class)
- Solving problems involving elapsed time

Assessed Benchmarks

- Identify sources of measurement error
- Recognize that the same count of different-sized units yields different lengths
- Recognize that, when measuring the same length, larger units yield smaller counts
- Measure objects using inches and centimeters
- Use a ruler to measure lengths longer than one foot
- Solve problems involving the beginning time of an event, ending time of an event, and duration of the event; given two of these, find the third for events beginning and ending on the hour or half-hour
- Use a timeline to record and determine duration to the hour or half-hour

Content Scope & Sequence

GRADE 3

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Trading Stickers, Combining Coins (Addition, Subtraction, and the Number System 1)

Mathematical Emphases

❶ The Base-Ten Number System Understanding the equivalence of one group and the units that comprise it

Math Focus Points

- Recognizing and representing the place value of each digit in 2- and 3-digit numbers
- Using equivalencies among pennies, dimes, and dollars
- Finding different combinations of 100s, 10s, and 1s for a number and recognizing their equivalence (i.e. 1 hundred, 3 tens, and 7 ones equals 1 hundred, 2 tens, and 17 ones, or 13 tens and 7 ones)
- Recognizing and demonstrating the equivalence of one 100 to ten 10s and of one 10 to ten 1s
- Recognizing and using coin equivalencies

❷ Computational Fluency Adding and subtracting accurately and efficiently

Math Focus Points

- Adding and subtracting multiples of 10
- Solving addition problems with 2-digit numbers by using strategies that involve breaking numbers apart by place or adding one number in parts
- Solving addition problems with 2-digit numbers that involve more than 10 ones in the ones place and explaining the effect on the sum
- Finding the difference between a 2-digit number and 100
- Adding pennies and dimes to sums up to $2.00
- Learning/reviewing addition combinations up to $10 + 10$
- Using knowledge of place value to find pairs of 2-digit numbers that add to 100 or a number close to 100
- Using known pairs of 2-digit numbers that add to 100 to find related pairs that add to 100 or a number close to 100 (for example, $20 + 80 = 100$, so $22 + 78 = 100$)
- Estimating the sums of 2-digit numbers by using knowledge of place value and known combinations
- Finding combinations of coins that equal $1.00

This Unit also focuses on

- Using mathematical tools (cubes, 100 charts and grids, number lines) to solve problems and represent strategies

Classroom Routines focus on

- Learning about temperature: reading a thermometer, learning to associate different temperatures with words such as colder and warmer, establishing landmark temperatures
- Recording information in a table and on a graph
- Reading information from the shape of a graph: hot, cold, increasing, decreasing

Ten-Minute Math activities focus on

- Recognizing and interpreting the value of each digit in 2- and 3-digit numbers
- Finding different combinations of a number, using only 100s, 10s, and 1s and recognizing their equivalence (e.g., 1 hundred, 3 tens, and 7 ones equals 1 hundred, 2 tens, and 17 ones or 13 tens and 7 ones)
- Reading and writing numbers up to 1,000
- Adding multiples of 10 to, and subtracting multiples of 10 from, 2- and 3-digit numbers
- Breaking apart, reordering, or combining numbers within a problem for easier computation
- Using knowledge of place value and known combinations to estimate sums
- Practicing addition and subtraction skills

Assessed Benchmarks

- Demonstrate fluency with the addition combinations up to $10 + 10$
- Add multiples of 10 (up to 100) to and subtract them from 2-digit and small 3-digit numbers
- Solve addition problems with 2-digit numbers using strategies that involve breaking numbers apart by place or adding one number in parts
- Break up 3-digit numbers (less than 200) into 100s, 10s, and 1s in different ways (e.g., 153 equals 1 hundred, 5 tens, and 3 ones; 15 tens and 3 ones; 14 tens and 13 ones, etc.)
- Find combinations of 2-digit numbers that add to 100 or $1.00

Surveys and Line Plots (Data Analysis)

Mathematical Emphases

❶ Data Analysis Describing, summarizing, and comparing data

Math Focus Points

- Describing and interpreting categorical data
- Using summaries such as almost all, very few, half, or more than half
- Using data to compare groups
- Describing the shape of ordered, numerical data: where data are spread out or concentrated, where there are few data, highest and lowest values, and outliers
- Developing arguments based on the data
- Describing what values are typical or atypical in a data set

❷ Data Analysis Representing data

Math Focus Points

- Developing classifications to organize categorical data
- Organizing categorical data in different ways to answer different questions
- Representing categorical data by using a picture or graph
- Considering how well a data representation communicates to an audience
- Reading and interpreting a bar graph
- Reading a scale on a graph with intervals larger than 1
- Using a line plot, bar graph, or other representation to represent ordered, numerical data
- Interpreting what the numbers and symbols on a line plot mean
- Developing a consistent scale to show where data are and are not concentrated
- Reading and interpreting a representation of ordered, numerical data

❸ Data Analysis Designing and carrying out a data investigation

Math Focus Points

- Developing and revising a survey question
- Interpreting results of a data investigation

❹ Linear Measurement Measuring with standard units

Math Focus Points

- Measuring in inches
- Measuring lengths longer than the measuring tool
- Understanding the relationship between feet and inches
- Combining feet and inches to get a total measurement
- Using correct notation to write a measurement in feet and inches

Classroom Routines focus on

- Learning about temperature: reading a thermometer, learning to associate different temperatures with words like colder and warmer, and establishing landmark temperatures
- Recording information in a table and on a graph
- Reading information from the shape of a graph: hot, cold, increasing, decreasing

Ten-Minute Math activities focus on

- Breaking apart, reordering, or combining numbers within a problem for easier computation
- Using knowledge of place value and known combinations to estimate sums and differences
- Practicing addition and subtraction skills
- Using evidence and formulating questions to make hypotheses about the common characteristics of groups of people or things
- Systematically eliminating possibilities
- Generating equivalent expressions for a number using particular constraints
- Practicing computation skills
- Using notation to record expressions

Assessed Benchmarks

- Organize, represent, and describe categorical data, choosing categories that help make sense of the data
- Interpret a bar graph
- Make a line plot for a set of numerical data
- Describe the shape of the data for a numerical data set, including where data are concentrated, where there are few data, what the lowest and highest values are, what the mode is, and where there is an outlier
- Summarize a set of data, describing concentrations of data and what those concentrations mean in terms of the situation the data represent

Collections and Travel Stories (Addition, Subtraction, and the Number System 2)

Mathematical Emphases

❶ The Base-Ten Number System Extending knowledge of the number system to 1,000

Math Focus Points

- Reading, writing, and sequencing numbers to 1,000
- Using place value to determine the size of any number to 1,000

❷ The Base-Ten Number System Understanding the equivalence of one group and the discrete units that comprise it

Math Focus Points

- Constructing 1,000 from groups of 100
- Recognizing and representing the groups of 10s in 3-digit numbers
- Representing the structure of 3-digit numbers as being composed of 100s, 10s, and 1s
- Using the value of each place to make 2- and 3-digit numbers closest to 100

❸ Computational Fluency Adding and subtracting accurately and efficiently

Math Focus Points

- Estimating the sums of 2- and 3-digit numbers using knowledge of place value and known combinations
- Finding pairs of numbers that add to 100
- Finding the difference between 3-digit numbers
- Solving addition problems with 2- and 3-digit numbers (up to 400) by breaking numbers apart and recombining them
- Representing addition strategies
- Adding and subtracting multiples of 10 and 100
- Developing strategies for solving addition problems by focusing on how each strategy starts
- Gaining fluency with subtraction facts related to addition combinations up to 10 + 10
- Finding the difference between 2- and 3-digit numbers and 100
- Using multiples of 100 as a landmark to solve subtraction problems
- Finding the difference between two numbers by either adding or subtracting
- Reasoning about how increasing or decreasing the numbers in a subtraction problem affects the difference
- Solving subtraction problems with 2- and 3-digit numbers (up to 300) using strategies that involve either subtracting one number in parts, adding up, or subtracting back

❹ Whole-Number Operations Understanding different types of subtraction problems

Math Focus Points

- Solving subtraction problems that involve finding a missing part
- Visualizing and representing the action of a subtraction problem that involves finding a missing part
- Understanding comparison as the difference between two numbers
- Solving subtraction story problems that involve comparison
- Visualizing and representing the action of comparison problems
- Using number lines to represent solutions to comparison problems
- Solving subtraction problems that involve removal
- Visualizing and representing the action of removal problems

Classroom Routines and Ten-Minute Math activities focus on

- Generating equivalent expressions for a number using particular constraints
- Practicing computation skills
- Using notation to record expressions
- Naming, notating, and telling time to the nearest 5 minutes on a digital or analog clock
- Determining intervals of time to the nearest 5 minutes

Assessed Benchmarks

- Read, write, and sequence numbers to 1,000
- Identify the value of each digit in a 3-digit number (100s, 10s, and 1s)
- Identify how many groups of 10 are in a 3-digit number (e.g., 153 has 15 groups of 10, plus 3 ones)
- Solve addition problems with 3-digit numbers (up to 400) by using strategies that involve breaking numbers apart, either by place value or by adding one number in parts
- Solve subtraction story problems in contexts that include removing a part from a whole, comparing 2 quantities, or finding the missing part
- Solve subtraction problems with 2- and 3-digit numbers (up to 300) by using strategies that involve subtracting one number in parts, adding up, or subtracting back

Perimeter, Angles, and Area (2-D Geometry and Measurement)

Mathematical Emphases

❶ Linear Measurement Measuring with standard units

Math Focus Points

- Reviewing the length of units of measure (inch, foot, yard, centimeter, and meter)
- Establishing measurement benchmarks
- Using U.S. standard and metric units to accurately measure length
- Recognizing and explaining possible sources of measurement error

❷ Linear Measurement Understanding and finding perimeter

Math Focus Points

- Understanding perimeter as the measure around the outside edges of a 2-dimensional figure
- Finding perimeter using standard units
- Creating different shapes with the same perimeter
- Finding the perimeter of an irregular shape

❸ Area Measurement Understanding and finding area

Math Focus Points

- Understanding that area is measured in square units
- Understanding that when measuring area, the space being measured must be completely covered with no gaps or overlaps
- Using squares and triangles to make shapes with an area of four square units
- Examining the relationship between the area of squares and triangles
- Understanding that shapes with the same area can look different
- Finding the area of partially covered rectangles
- Finding the area of an irregular shape
- Designing a shape for a given area
- Finding area by counting or calculating whole and partial square units

❹ Features of Shape Describing and classifying 2-dimensional figures

Math Focus Points

- Determining the geometric moves needed (slides, flips, turns) to prove or disprove congruence between two shapes
- Identifying the attributes of triangles: three sides, three vertices, and three angles
- Identifying the attributes of quadrilaterals: four sides, four vertices, and four angles
- Comparing the properties of squares and rectangles

❺ Features of Shape Describing and measuring angles

Math Focus Points

- Recognizing right angles
- Identifying a right angle as having a measure of 90˚
- Understanding angle size as the degree of turn
- Comparing the sizes of angles

Classroom Routines focus on

- Learning about temperature: reading a thermometer, learning to associate different temperatures with words like colder and warmer, and establishing landmark temperatures
- Recording information in a table and on a graph
- Reading information from the shape of a graph: hot, cold, increasing, decreasing

Ten-Minute Math activities focus on

- Recognizing and interpreting the value of each digit in 3-digit numbers
- Finding different combinations of numbers, such as 100s, 10s, and 1s, that are equivalent, (i.e., 1 hundred, 3 tens, and 7 ones 5 1 hundred, 2 tens, and 17 ones 5 13 tens and 7 ones 5 12 tens and 17 ones, and so on)
- Reading and writing numbers up to 1,000
- Adding multiples of 10 to, and subtracting multiples of 10 from 3-digit numbers
- Organizing and analyzing visual images
- Developing language and concepts needed to communicate about spatial relationships
- Decomposing images of 2-D shapes and then recombining them to make a given design

Assessed Benchmarks

- Identify and measure the perimeter of a figure using U.S. standard and metric units
- Identify and find the area of given figures by counting whole and partial square units
- Identify triangles as three-sided closed figures with three vertices and three angles
- Identify right angles, and recognize whether an angle is larger or smaller than a right angle

Equal Groups (Multiplication and Division)

Mathematical Emphases

❶ Whole-Number Operations Understanding the meaning of multiplication

Math Focus Points

- Understanding multiplication as combining equal groups
- Writing and solving multiplication problems in context
- Identifying the number of groups, the number in each group, and the product in a multiplication situation
- Understanding the relationship among skip counting, repeated addition, and multiplication
- Using and understanding multiplication notation

❷ Whole-Number Operations Reasoning about numbers and their factors and multiples

Math Focus Points

- Finding the multiples of the numbers 2, 3, 4, 5, 6, and 10 by skip counting
- Describing and comparing characteristics of the multiples of a number
- Understanding that doubling (or halving) one factor in a multiplication expression doubles (or halves) the product

❸ Whole-Number Operations Understanding and working with an array model of multiplication

Math Focus Points

- Using arrays to model multiplication situations
- Using arrays to find factors of 2-digit numbers up to 50
- Using arrays to identify characteristics of numbers, including prime and square numbers
- Using arrays to find a product by skip counting by one of its dimensions
- Breaking an array into parts to find the product represented by the array

❹ Computational Fluency Learning the multiplication combinations with products up to 50 fluently

Math Focus Points

- Using known multiplication combinations to determine the product of more difficult combinations
- Identifying and learning multiplication combinations not yet known

❺ Whole-Number Operations Developing strategies for division based on understanding the inverse relationship between multiplication and division

Math Focus Points

- Understanding division as the splitting of a quantity into equal groups
- Using the inverse relationship between multiplication and division to solve problems
- Using multiplication combinations to solve division problems
- Using and understanding division notation
- Writing and solving division problems in context

Ten-Minute Math activities focus on

- Telling time to any minute on a digital or analog clock
- Determining intervals of time to the minute
- Finding the multiples of numbers through skip counting
- Becoming familiar with multiplication patterns
- Understanding the relationship between skip counting and multiplication

Assessed Benchmarks

- Demonstrate an understanding of multiplication and division as involving groups of equal groups
- Solve multiplication combinations and related division problems by using skip counting or known multiplication combinations
- Interpret and use multiplication and division notation
- Demonstrate fluency with multiplication combinations with products up to 50 (by the end of Grade 3)

Stories, Tables, and Graphs (Patterns, Functions, and Change)

Mathematical Emphases

❶ Using Tables and Graphs Using graphs to represent change

Math Focus Points

- Describing the overall shape of a line graph—increasing, decreasing, staying the same
- Finding the difference between values on a line graph, including the difference between a positive and negative value
- Associating a story with its corresponding graph
- Plotting points on a graph to represent a situation in which one quantity is changing in relation to another
- Identifying points on a graph with corresponding values in a table and interpreting the numerical information in terms of the situation the graph represents
- Comparing situations by describing differences in their graphs

❷ Using Tables and Graphs Using tables to represent change

Math Focus Points

- Using tables to represent the relationship between two quantities in a situation with a constant rate of change
- Interpreting numbers in a table in terms of the situation they represent
- Comparing situations by describing differences in the tables that represent them

❸ Linear Change Describing and representing a constant rate of change

Math Focus Points

- Describing the relationship between two quantities in a situation with a constant rate of change, taking into account a beginning amount and a constant increase
- Creating a representation for a situation with a constant rate of change
- Comparing different representations that show the same situation
- Making rules that relate one variable to the other in situations with a constant rate of change
- Connecting the steps of a general method or rule to the parts of the situation they represent

❹ Number Sequences Constructing, describing, and extending number sequences with constant increments generated by various contexts

Math Focus Points

- Identifying the unit of a repeating pattern
- Associating counting numbers with elements of a pattern
- Determining the element of an ABC pattern associated with a particular counting number
- Describing and extending a number sequence with a constant increment (e.g., 3, 6, 9, . . . or 2, 5, 8, . . .)
- Identifying numbers that are multiples of three, or one less or one more than a multiple of 3

❺ Measuring Temperature Understanding temperature and measuring with standard units

Math Focus Points

- Reading and interpreting positive and negative temperatures on a thermometer and on a line graph
- Associating temperatures with particular activities or clothing

Ten-Minute Math activities focus on

- Using evidence and formulating questions to make hypotheses about the common characteristics of numbers
- Systematically eliminating possibilities
- Using mathematical terms to describe numbers
- Generating equivalent expressions for a number using particular constraints
- Practicing computation skills
- Using notation to record expressions

Assessed Benchmarks

- Interpret graphs of change over time, including both the meaning of points on the graph and how the graph shows that values are increasing, decreasing, or staying the same
- Interpret temperature values (i.e., relate temperatures to seasons, to what outdoor clothing would be needed, and so on)
- Create a table of values for a situation with a constant rate of change and explain the values in the table in terms of the situation
- Compare related situations with a constant rate of change by interpreting the graphs, tables, and sequences that represent those situations

Finding Fair Shares (Fractions and Decimals)

Mathematical Emphases

❶ Rational Numbers Understanding the meaning of fractions (halves, fourths, eighths, thirds, sixths) and decimal fractions (0.50, 0.25) as equal parts of a whole (an object, an area, a set of objects)

Math Focus Points

- Finding equal parts of a whole and naming them with fractions
- Dividing an area into equal parts
- Naming fractional parts with unit fractions (½, ⅓, ¼, etc.)
- Ordering unit fractions
- Demonstrating that different-shaped pieces that are the same fraction of the same area have equal areas
- Naming fractional parts with fractions that have numerators greater than 1 (¾, ⅔, ⅚, etc.)
- Dividing a group into equal parts and naming the parts with fractions
- Identifying equivalent fractional parts
- Using fraction notation to record equivalencies (e.g., $\frac{3}{6} = \frac{1}{2}$, $\frac{1}{2} = \frac{2}{4}$)
- Using mixed numbers to represent quantities greater than 1
- Identifying equivalent fractions and decimals for values involving halves and fourths (e.g., $\frac{1}{2} = 0.50$, $\frac{1}{4} = 0.25$, $2\frac{1}{2} = 2.5$)
- Reading, writing, and interpreting the meaning of the decimal numbers 0.50, 0.25, and numbers greater than 1 with these decimal portions, such as 2.5 and 2.25

❷ Rational Numbers Using representations to combine fractions (halves, fourths, eighths, thirds, and sixths)

Math Focus Points

- Using representations to combine fractions that sum to 1
- (e.g., $\frac{1}{4} + \frac{3}{4} = 1$, $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = 1$, $\frac{1}{2} + \frac{1}{4} + \frac{1}{4} = 1$)
- Using representations to combine fractions to equal other fractions ($\frac{1}{2} = \frac{1}{3} + \frac{1}{6}$)
- Fraction sense is based on the development of visual images of equivalent fractions, especially relationships among halves, fourths, and eighths and among halves, thirds, and sixths. Using understanding of these equivalents in the contexts of rectangular "brownies," pattern blocks, and groups of things, students find combinations of fractions that are equivalent to a whole or to another fraction (e.g., $\frac{1}{2} + \frac{2}{6} + \frac{1}{6} = 1$, $\frac{1}{3} + \frac{1}{6} = \frac{1}{2}$).

Classroom Routines focus on

- Learning about temperature: reading a thermometer, learning to associate different temperatures with words like colder and warmer, and establishing landmark temperatures
- Recording information in a table and on a graph
- Reading information from the shape of a graph: hot, cold, increasing, decreasing

Ten-Minute Math activities focus on

- Generating equivalent expressions for a number using particular constraints
- Practicing computation skills
- Using notation to record expressions
- Telling time to any minute on a digital or analog clock
- Determining intervals of time to the minute

Assessed Benchmarks

- Divide a single whole or a quantity into equal parts, and name those parts as fractions or mixed numbers
- Identify equivalent fractions (e.g., $\frac{3}{6} = \frac{1}{2}$ and $\frac{1}{3} = \frac{2}{6}$)
- Find combinations of fractions that are equal to one and to other fractions (e.g., $\frac{3}{6} + \frac{1}{2} = 1$; $\frac{1}{6} + \frac{1}{6} = \frac{1}{3}$; and $\frac{1}{3} + \frac{1}{6} = \frac{1}{2}$)

How Many Hundreds? How Many Miles? (Addition, Subtraction, and the Number System 3)

Mathematical Emphases

❶ Computational Fluency Adding and subtracting accurately and efficiently

Math Focus Points

- Combining hundreds to numbers above 1,000
- Subtracting from multiples of 100
- Adding multiples of 10 and 100 to, and subtracting them from, 3-digit numbers
- Estimating answers to subtraction problems with 3-digit numbers
- Using the relationship of numbers in a subtraction expression to multiples of 100 to solve subtraction problems
- Solving addition problems with 3-digit numbers
- Estimating and solving addition problems with sums greater than 1,000
- Solving addition problems with more than 2 addends
- Estimating which of two sums is greater
- Knowing and using subtraction problems related to the addition combinations to 10 + 10 (the subtraction facts, e.g., 8 - 5, 13 - 9) with fluency
- Solving addition and subtraction problems in the context of money (dollars, cents)
- Determining combinations of addends for a given sum
- Solving addition and subtraction problems with more than one step

❷ Whole-Number Operations Describing, analyzing, and comparing strategies for adding and subtracting whole numbers

Math Focus Points

- Using story contexts and representations to support explanations about how changing a number in a subtraction problem affects the difference (e.g., 200 - 75 = 125 and 200 - 78 = 122)
- Solving addition problems by changing the numbers to create an equivalent problem that is easier to solve
- Using story contexts and representations to support explanations about equivalent addition expressions (e.g., 88 + 105 = 90 + 103)
- Identifying addition strategies by focusing on how each strategy starts
- Solving subtraction problems that involve comparison, removal, or finding a missing part
- Subtracting 3-digit numbers by using strategies that involve either subtracting one number in parts, adding up, or subtracting back
- Representing solutions to subtraction problems with number lines, 1,000 charts, and/or story contexts
- Subtracting by using strategies that involve changing one number to make a problem that is easier to solve

This Unit also focuses on

- Reading and writing numbers in the thousands
- Fluently solving multiplication combinations with products to 50

Ten-Minute Math activities focus on

- Finding the multiples of numbers through skip counting
- Becoming familiar with multiplication patterns
- Understanding the relationship between skip counting and multiplication
- Using evidence and formulating questions to make hypotheses about the common characteristics of groups of people or things
- Systematically eliminating possibilities

Assessed Benchmarks

- Add multiples of 10 and 100 (up to 1,000) to and subtract them from any 3-digit number
- Solve 3-digit addition problems using at least one strategy efficiently
- Demonstrate fluency with subtraction problems related to the addition combinations to 10 + 10 (the subtraction facts)
- Solve subtraction problems with 3-digit numbers using strategies that involve either subtracting a number in parts, adding up, or subtracting back
- Demonstrate fluency with multiplication combinations with products up to 50 (final review)

Solids and Boxes (3-D Geometry and Measurement)

Mathematical Emphases

❶ Features of Shape Describing properties of 3-dimensional shapes

Math Focus Points

- Describing the components and properties of different classes of solids such as polyhedra (3-D shapes having only flat surfaces, such as prisms and pyramids) and nonpolyhedra (such as cones and cylinders)
- Distinguishing between polyhedra and nonpolyhedra
- Distinguishing between prisms and pyramids
- Identifying the components of polyhedra (faces, edges, and vertices) and how they come together to form the whole
- Visualizing and building polyhedra by using knowledge of their components (faces, edges, and vertices) and how they come together to form the whole

❷ Features of Shape Translating between 2-dimensional and 3-dimensional shapes

Math Focus Points

- Determining the number and shapes of the faces of cubes and other rectangular prisms and how they come together to form the whole
- Designing patterns that make open boxes for a cube
- Designing patterns that make open boxes for 2-cube rectangular prisms
- Determining the number and shapes of the faces of a triangular pyramid and how they come together to form the whole
- Designing patterns that make nets for triangular pyramids
- Communicating about spatial relationships
- Decomposing images of 3-D shapes and then recombining them to make a given structure

❸ Volume Structuring rectangular prisms and determining their volume

Math Focus Points

- Determining the number of cubes that will fit in the box made by a given pattern
- Designing patterns for boxes that will hold a given number of cubes
- Seeing that the cubes filling a rectangular prism can be decomposed into congruent layers

Classroom Routines and Ten-Minute Math activities focus on

- Recognizing and interpreting the value of each digit in 3-digit numbers
- Finding different combinations of a number, using only 100s, 10s, and 1s and recognizing their equivalence (i.e., 1 hundred, 3 tens, and 7 ones = 1 hundred, 2 tens, and 17 ones = 13 tens and 7 ones = 12 tens and 17 ones, etc.)
- Reading and writing numbers up to 1,000
- Adding multiples of 10 to, and subtracting multiples of 10 from, 3-digit numbers
- Breaking apart, reordering, or combining numbers within a problem, for easier computation
- Using knowledge of place value and known combinations to estimate sums and differences
- Practicing addition and subtraction skills
- Organizing and analyzing visual images
- Developing language and concepts needed to communicate about spatial relationships
- Decomposing images of 3-D shapes and then recombining them to make a given structure

Assessed Benchmarks

- Identify and compare attributes of 3-D solids
- Determine the number of cubes (volume) that will fit in the box made by a given pattern
- Design patterns for boxes that will hold a given number of cubes

Content Scope & Sequence

GRADE 4

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Factors, Multiples, and Arrays (Multiplication and Division 1)

Mathematical Emphases

❶ Whole-Number Operations Understanding and working with an array model of multiplication

Math Focus Points

- Using arrays to model multiplication situations
- Breaking an array into parts to find the product represented by the array
- Using arrays to find factors of 2-digit numbers
- Identifying features of numbers, including prime, square, and composite numbers

❷ Whole-Number Operations Reasoning about numbers and their factors

Math Focus Points

- Finding the multiples of a number by skip counting
- Determining whether one number is a factor or multiple of another
- Identifying the factors of a given number
- Identifying all the factors of 100
- Using knowledge of the factors of 100 to find factors of multiples of 100
- Using known multiplication combinations to find related multiplication combinations for a given product (e.g., if 4 x 50 = 200, then 8 x 25 = 200)
- Using representations to show that a factor of a number is also a factor of its multiples (e.g., if 25 is a factor of 100, then 25 is also a factor of 300)

❸ Computational Fluency Fluency with multiplication combinations to 12 x 12

Math Focus Points

- Identifying and learning multiplication combinations not yet known fluently
- Using known multiplication combinations to determine the products of more difficult combinations

Ten-Minute Math activities focus on

- Generating equivalent expressions for a number using particular constraints
- Practicing computation skills
- Using notation to record expressions
- Organizing and analyzing visual images
- Writing equations to represent the total number of dots in a pattern
- Finding the multiples of numbers through skip counting
- Becoming familiar with multiplication patterns
- Understanding the relationship between skip counting and multiplication

Assessed Benchmarks

- Use known multiplication combinations to find the product of any multiplication combination up to 12 x 12
- Use arrays, pictures or models of groups, and story contexts to represent multiplication situations
- Find the factors of 2-digit numbers

Describing the Shape of the Data (Data Analysis and Probability)

Mathematical Emphases

❶ Data Analysis Representing data

Math Focus Points

- Organizing ordered numerical data to describe a data set
- Using a line plot to represent ordered numerical data
- Representing two sets of data in order to compare them

❷ Data Analysis Describing, summarizing, and comparing data

Math Focus Points

- Describing the shape of a data set: where the data are spread out or concentrated, what the highest and lowest values are, what the range is, and what the outliers are
- Describing what values are typical or atypical in a data set
- Determining the range of a data set
- Describing and interpreting data that compare two groups
- Finding the median of a data set
- Using medians to compare groups
- Considering what information a median does and does not provide
- Comparing two sets of data using the shape and spread of the data

❸ Data Analysis Analyzing and interpreting data

Math Focus Points

- Developing arguments based on data
- Drawing conclusions based on data

❹ Data Analysis Designing and carrying out a data investigation

Math Focus Points

- Recording and keeping track of data
- Considering how well a data representation communicates to an audience
- Developing and revising a survey question

❺ Probability Describing the probability of an event

Math Focus Points

- Associating the word probability with the likelihood of an event
- Arranging events along a line representing the range of certain to impossible
- Using numbers from 0 to 1 as measures of probability
- Associating verbal descriptions of probability with numeric descriptions
- Comparing the expected probability of an event with the actual results of repeated trials of that event

This Unit also focuses on

- Using U.S. standard units to measure lengths longer than the measuring tool

Ten-Minute Math activities focus on

- Describing features of the data
- Interpreting and posing questions about the data
- Generating equivalent expressions for a number using particular constraints
- Practicing computation skills
- Using notation to record expressions

Assessed Benchmarks

- Design an effective survey question to compare two groups
- Organize and represent data about two groups in order to compare the groups
- Describe the shape of the data from a numerical data set, including where the data are concentrated and the highest, lowest, and median values
- Use data to compare two groups
- Use evidence from a set of data to support an argument
- Describe the likelihood of an event in terms of a scale from impossible (probability of 0) to certain (probability of 1)

Multiple Towers and Division Stories (Multiplication and Division 2)

Mathematical Emphases

❶ Computational Fluency Solving multiplication problems with 2-digit numbers

Math Focus Points

- Developing strategies for multiplying that involve breaking apart numbers
- Reviewing multiplication combinations to 12 x 12
- Multiplying multiples of 10

❷ Whole-Number Operations Understanding and using the relationship between multiplication and division to solve division problems

Math Focus Points

- Solving division story problems
- Using and interpreting division notation
- Solving division problems by making groups of the divisor
- Using known multiplication combinations to solve division problems

❸ Whole-Number Operations Reasoning about numbers and their factors

Math Focus Points

- Understanding the effect of multiplying by a multiple of 10 (e.g., describing the relationship between 3 x 4 and 3 x 40)
- Finding multiples of 2-digit numbers
- Describing a sequence of multiples in order to predict other multiples
- Determining the effect on the product when a factor is doubled or halved

❹ Whole-Number Operations Representing the meaning of multiplication and division

Math Focus Points

- Representing a multiplication or division problem with pictures, diagrams, or models
- Using arrays to model multiplication
- Making sense of remainders in terms of the problem context
- Creating a story problem to represent a division expression
- Comparing visual representations of multiplication situations

Ten-Minute Math activities focus on

- Organizing and analyzing visual images
- Writing equations to represent the total number of dots in a pattern
- Finding the multiples of numbers through skip counting
- Becoming familiar with multiplication patterns
- Understanding the relationship between skip counting and multiplication

Assessed Benchmarks

- Multiply 2-digit numbers by 1-digit and small 2-digit numbers (e.g., 12, 15, 20), using strategies that involve breaking the numbers apart
- Solve division problems (2-digit and small 3-digit numbers divided by 1-digit numbers), including some that result in a remainder
- Use story problems, pictures, or concrete models to represent division situations
- Multiply by 10 and multiples of 10
- Demonstrate fluency with multiplication combinations up to 12 x 12

Size, Shape, and Symmetry (2-D Geometry and Measurement)

Mathematical Emphases

❶ Linear Measurement Measuring with standard units

Math Focus Points

- Reviewing the lengths of units of measure (inches, feet, yards, centimeters, meters)
- Using U.S. standard and metric units to accurately measure length
- Estimating lengths based on common units (centimeter, inch, foot, yard, meter)
- Determining when estimates or exact measurements are needed
- Finding perimeter using standard units
- Recognizing and explaining possible sources of measurement error
- Comparing different paths that have the same length

❷ Features of Shape Describing and classifying 2-dimensional figures

Math Focus Points

- Defining polygons as closed figures with line segments as sides, and vertices
- Classifying polygons by attribute, including number of sides, length of sides, and size of angles
- Combining polygons to make new polygons
- Recognizing number of sides as a descriptor of various polygons
- Developing vocabulary to describe attributes and properties of quadrilaterals
- Understanding the relationship between squares and rectangles

❸ Features of Shape Describing and measuring angles

Math Focus Points

- Identifying a right angle as 90˚
- Measuring acute angles by relating them to 90˚
- Using known angles to find the measure of other angles

❹ Area Measurement Finding and understanding area

Math Focus Points

- Finding the area of symmetrical designs
- Understanding that the larger the unit of area, the smaller the number of units needed to measure the area
- Dividing irregular polygons into two shapes that have equal area
- Finding the area of polygons by decomposing shapes
- Finding the area of polygons using square units
- Finding the area of rectangles
- Finding the area of triangles in relation to the area of rectangles

This Unit also focuses on

- Making designs with mirror symmetry

Ten-Minute Math activities focus on

- Organizing and analyzing visual images
- Developing language and concepts needed to communicate about spatial relationships
- Decomposing images of 2-D shapes and then recombining them to make a given design
- Generating equivalent expressions for a number using particular constraints
- Practicing computation skills
- Using notation to record expressions

Assessed Benchmarks

- Use appropriate measurement tools to measure distance
- Identify quadrilaterals as any four-sided closed figure
- Know that a right angle measures 90˚, and use this as a landmark to find angles of 30˚, 45˚, and 60˚
- Find the area of polygons using a square unit of measure

Landmarks and Large Numbers (Addition, Subtraction, and the Number System)

Mathematical Emphasis

❶ The Base-Ten Number System Extending knowledge of the number system to 10,000

Math Focus Points

- Reading, writing, and sequencing numbers to 1,000 and 10,000
- Understanding the structure of 10,000 and its equivalence to one thousand 10s, one hundred 100s, and ten 1,000s
- Recognizing the place value of digits in large numbers

❷ Computational Fluency Adding and subtracting accurately and efficiently

Math Focus Points

- Adding and subtracting multiples of 10, 100, and 1,000
- Using multiples of 10 and 100 to find the difference between any 3-digit number and 1,000
- Adding 3- and 4-digit numbers
- Using clear and concise notation for recording addition and subtraction strategies
- Finding combinations of 3-digit numbers that add to 1,000
- Solving subtraction problems by breaking numbers apart
- Solving multistep addition and subtraction problems
- Combining positive and negative numbers

❸ Whole-Number Operations Describing, analyzing, and comparing strategies for adding and subtracting whole numbers

Math Focus Points

- Representing addition and subtraction on a number line
- Identifying, describing, and comparing addition and subtraction strategies by focusing on how each strategy starts
- Developing arguments about why two addition expressions are equivalent (e.g., $597 + 375 = 600 + 372$)
- Using story contexts and representations to support explanations about equivalent addition expressions
- Understanding the meaning of the steps and notation of the U.S. algorithm for addition
- Developing arguments about how the differences represented by two subtraction expressions are related (e.g., 432 - 198 and 432 - 200)
- Using story contexts and representations to support explanations about related subtraction expressions

❹ Whole-Number Operations Understanding different types of subtraction problems

Math Focus Points

- Understanding the action of subtraction problems
- Representing subtraction situations

Ten-Minute Math activities focus on

- Generating equivalent expressions for a number using particular constraints
- Practicing computation skills
- Using notation to record expressions
- Reading and writing numbers up to 10,000
- Adding multiples of 10 to, and subtracting multiples of 10 from 3- and 4-digit number

Assessed Benchmarks

- Read, write, and sequence numbers up to 10,000
- Add and subtract multiples of 10 (including multiples of 100 and 1,000) fluently
- Solve addition problems efficiently, choosing from a variety of strategies
- Solve subtraction problems with 3-digit numbers by using at least one strategy efficiently

Fraction Cards and Decimal Squares (Fractions and Decimals)

Mathematical Emphases

❶ Rational Numbers Understanding the meaning of fractions and decimal fractions

Math Focus Points

- Finding fractional parts of a rectangular area
- Finding fractional parts of a group (of objects, people, etc.)
- Interpreting the meaning of the numerator and the denominator of a fraction
- Writing, reading, and applying fraction notation
- Representing fractions greater than 1
- Identifying everyday uses of fractions and decimals
- Reading and writing tenths and hundredths
- Representing tenths and hundredths as parts of an area

❷ Rational Numbers Comparing the values of fractions and decimal fractions

Math Focus Points

- Identifying relationships between unit fractions when one denominator is a multiple of the other (e.g., halves and fourths, thirds and sixths)
- Comparing the same fractional parts of different-sized wholes
- Identifying equivalent fractions
- Ordering fractions and justifying their order through reasoning about fraction equivalencies and relationships
- Representing fractions using a number line
- Comparing fractions to the landmarks 0, ½, 1, and 2
- Ordering decimals and justifying their order through reasoning about representations and the meaning of the numbers
- Identifying decimal and fraction equivalents

❸ Computation with Rational Numbers Using representations to add rational numbers

Math Focus Points

- Using representations to add fractions that sum to 1
- Estimating sums of fractions
- Adding fractions with the same and related denominators (e.g., halves, fourths, and eighths; thirds and sixths)
- Estimating sums of decimal numbers
- Adding decimal numbers that are multiples of 0.1 and 0.25 (e.g., 2.3 + 3.25)
- Using representations to combine tenths and hundredths

Ten-Minute Math activities focus on

- Reading and writing numbers up to 10,000
- Adding multiples of 10 to, and subtracting multiples of 10 from 3- and 4-digit numbers
- Reading and writing decimal fractions and decimal numbers
- Adding tenths and hundredths, and subtracting them from decimal fractions and decimal numbers
- Describing features of the data
- Interpreting and posing questions about the data

Assessed Benchmarks

- Identify fractional parts of an area
- Identify fractional parts of a group (of objects, people, etc.)
- Read, write, and interpret fraction notation
- Order fractions with like and unlike denominators
- Read, write, and interpret decimal fractions in tenths and hundredths

Moving Between Solids and Silhouettes (3-D Geometry and Measurement)

Mathematical Emphases

❶ Features of Shape Describing properties of 3-dimensional shapes

Math Focus Points

- Describing attributes of geometric solids
- Naming geometric solids

❷ Features of Shape Translating between 2-dimensional and 3-dimensional shapes

Math Focus Points

- Understanding how 3-D solids project silhouettes with 2-D shapes (for example, how a cone can produce both triangular and circular silhouettes)
- Decomposing images of 3-D shapes and then recombining them to make a given structure
- Visualizing what 3-D figures look like from different perspectives
- Recognizing how components of 3-D cube buildings come together to form the whole building
- Drawing silhouettes of 3-D cube buildings from different perspectives
- Integrating different silhouettes of an object, both to form a mental model and to build the whole object

❸ Volume Structuring rectangular prisms and determining their volume

Math Focus Points

- Seeing that cubes filling a rectangular prism can be decomposed into congruent layers
- Finding the volume of cube buildings
- Designing patterns for boxes that hold a given number of cubes (volume)
- Developing a strategy for determining the volume of rectangular prisms
- Finding the number of cubes (volume) that will fit into the box made by a given pattern
- Doubling the number of cubes for a given box and considering how that changes the dimensions of the original box

Ten-Minute Math activities focus on

- Reading and writing decimal fractions and decimal numbers
- Adding multiples of one-tenth to, and subtracting multiples of one-tenth from decimal fractions and decimal numbers
- Organizing and analyzing visual images
- Developing language and concepts needed to communicate about spatial relationships
- Decomposing images of 3-D shapes and then recombining them to make a given structure

Assessed Benchmarks

- Identify 2-D silhouettes of 3-D solids (e.g., a cone can project a triangular silhouette)
- Draw 2-D representations showing different perspectives of a 3-D object
- Find the volume of cube buildings and rectangular prisms

How Many Packages? How Many Groups? (Multiplication and Division 3)

Mathematical Emphases

❶ Computational Fluency Solving multiplication problems with 2-digit numbers

Math Focus Points

- Estimating solutions to 2-digit multiplication problems
- Multiplying multiples of 10
- Solving 2-digit multiplication problems by breaking a problem into smaller parts and combining the subproducts
- Solving 2-digit multiplication problems by changing one factor to create an easier problem

❷ Whole-Number Operations Understanding division as making groups of the divisor

Math Focus Points

- Solving division problems by breaking the problem into parts
- Using multiples of 10 to solve division problems
- Using the relationship between multiplication and division to solve division problems

This Unit also focuses on

- Representing a multiplication or division problem with pictures or diagrams, including arrays and pictures of groups
- Using a story problem represented by a multiplication expression to keep track of parts of the problem

Ten-Minute Math activities focus on

- Becoming familiar with multiplication patterns
- Finding the multiples of numbers through skip counting
- Using the nearest landmark number to find multiples of a given number
- Approximating numbers to nearby landmark numbers, e.g., multiples of 10 or 100
- Calculating mentally
- Comparing answer choices to find the one closest to the actual answer

Assessed Benchmarks

- Multiply 2-digit numbers efficiently
- Solve division problems with 1-digit and small 2-digit divisors by using at least one strategy efficiently

Penny Jars and Plant Growth (Patterns, Functions, and Change)

Mathematical Emphases

❶ Using Tables and Graphs Using graphs to represent change

Math Focus Points

- Interpreting the points and shape of a graph in terms of the situation the graph represents
- Finding the difference between two values on a line graph
- Discriminating between features of a graph that represent quantity and those that represent changes in quantity
- Identifying points in a graph with corresponding values in a table and interpreting the numerical information in terms of the situation the graph represents
- Plotting points on a coordinate grid to represent a situation in which one quantity is changing in relation to another
- Comparing situations by describing the differences in their graphs
- Describing the relative steepness of graphs or parts of graphs in terms of different rates of change
- Comparing tables, graphs, and situations of constant change with those of nonconstant change

❷ Using Tables and Graphs Using tables to represent change

Math Focus Points

- Using tables to represent the relationship between two quantities in a situation of constant change
- Interpreting numbers in a table in terms of the situation they represent

❸ Linear Change Describing and representing a constant rate of change

Math Focus Points

- Finding the value of one quantity in a situation of constant change, given the value of the other
- Creating a representation for a situation of constant change
- Describing the relationship between two quantities in a situation of constant change, taking into account a beginning amount and a constant increase
- Writing an arithmetic expression for finding the value of one quantity in terms of the other in a situation of constant change
- Making rules that relate one variable to another in situations of constant change
- Using symbolic letter notation to represent the value of one variable in terms of another

This Unit also focuses on

- Measuring in centimeters

Ten-Minute Math activities focus on

- Describing features of the data
- Interpreting and posing questions about the data
- Approximating numbers to nearby landmark numbers, e.g., multiples of 10 or 100
- Calculating mentally
- Comparing answer choices to find the one closest to the actual answer

Assessed Benchmarks

- Connect tables and graphs to each other and to the situations they represent
- Make a graph on a coordinate grid from a table of values
- Describe how a graph shows change: where the rate of change is increasing, decreasing, or remaining constant, and how differences in steepness represent differences in the rate of change
- Take into account the starting amount and the amount of change in describing and comparing situations of constant change
- In a situation of constant change, write rules (using words or arithmetic expressions) to determine the value of one quantity, given the value of the other

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GRADE 5

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Number Puzzles and Multiple Towers (Multiplication and Division 1)

Mathematical Emphases

❶ Whole-Number Operations Reasoning about numbers and their factors

Math Focus Points

- Determining whether one number is a factor or multiple of another
- Identifying prime, square, even, and odd numbers
- Using known multiplication combinations to find equivalent multiplication combinations (e.g., $18 = 3 \times 6 = 3 \times (2 \times 3)$)
- Using known multiplication combinations to find multiplication combinations for numbers related by place value (e.g., $3 \times 6 = 18$; $3 \times 6 \times 10 = 180$)
- Finding all the ways to multiply whole numbers for a given product
- Finding all the factors of a number
- Using properties (even, odd, prime, square) and relationships (factor, multiple) of numbers to solve problems
- Determining the prime factorization of a number

❷ Computational Fluency Solving multiplication problems with 2-digit numbers

Math Focus Points

- Solving 2-digit by 2-digit multiplication problems
- Describing and comparing strategies used to solve multiplication problems
- Breaking up multiplication problems efficiently
- Multiplying fluently by multiples of 10
- Estimating the product of two numbers
- Comparing multiplication problems to determine which product is greater

❸ Whole-Number Operations Understanding and using the relationship between multiplication and division to solve division problems

Math Focus Points

- Solving division problems with 2-digit divisors
- Using knowledge of multiples of 10 to solve division problems
- Using and interpreting notation that represents division and relating division and multiplication notations (e.g., $170 \div 15 =$ _____ and _____ $\times 15 = 170$)
- Describing and comparing strategies used to solve division problems
- Comparing division problems to determine which quotient is greater
- Solving a division problem by breaking the dividend into parts

❹ Whole-Number Operations Representing the meaning of multiplication and division

Math Focus Points

- Writing multiplication equations that describe dot arrangements
- Using arrays to model multiplication
- Representing a multiplication or division problem with a picture or diagram
- Creating a story problem represented by a multiplication or division expression
- Making sense of remainders in terms of problem contexts

This Unit also focuses on

- Using clear and concise notation
- Identifying and learning multiplication combinations ("facts") not yet known fluently

Ten-Minute Math activities focus on

- Organizing and analyzing visual images
- Developing language and concepts needed to communicate spatial relationships
- Writing equations to describe dot patterns
- Identifying prime, square, even, and odd numbers
- Determining whether one number is a factor or multiple of another

Assessed Benchmarks

- Find the factors of a number
- Solve multiplication problems efficiently
- Solve division problems with 1- and 2-digit divisors

Prisms and Pyramids (3-D Geometry and Measurement)

Mathematical Emphases

❶ Features of Shape Translating between 2-dimensional and 3-dimensional shapes

Math Focus Points

- Decomposing 3-D shapes and then recombining them to make a given building

❷ Volume Structuring rectangular prisms and determining their volume

Math Focus Points

- Determining the number of cubes that will fit into the box made by a given pattern
- Developing a strategy for determining the volume of rectangular prisms
- Designing patterns for boxes that hold a given number of cubes
- Finding the volume of rectangular prisms
- Considering how the dimensions of a box change when the volume is changed (doubled, halved, or tripled)
- Organizing rectangular packages to fit in rectangular boxes
- Designing a box that can be completely filled with several differently-shaped rectangular packages
- Determining the volume, in cubic centimeters, of a small prism
- Constructing units of volume—cubic centimeter, cubic inch, cubic foot, cubic yard (optional), cubic meter
- Choosing an appropriate unit of volume to measure a large space
- Finding the volume of a large space, such as the classroom, using cubic meters

❸ Volume Structuring prisms, pyramids, cylinders, and cones and determining their volume

Math Focus Points

- Comparing volumes of different-shaped containers
- Finding volume relationships between solids, particularly those with the same base and height
- Building a prism with three times the volume of a given pyramid
- Demonstrating the 3:1 relationship between rectangular prisms and pyramids with the same base and height
- Finding volume, in cubic centimeters, of prisms, pyramids, cylinders, and cones

This Unit also focuses on

- Describing and defending measurement methods
- Building rectangular solids

Ten-Minute Math activities focus on

- Organizing and analyzing visual images
- Developing language and concepts needed to communicate about spatial relationships
- Decomposing images of 3-D shapes and then recombining them to make a given building
- Estimating solutions to 2- and 3-digit multiplication and division problems
- Breaking apart, reordering, or changing numbers mentally to determine a reasonable estimate

Assessed Benchmarks

- Find the volume of rectangular prisms
- Use standard units to measure volume
- Identify how the dimensions of a box change when the volume is changed
- Explain the relationship between the volumes of prisms and pyramids with the same base and height

Thousands of Miles, Thousands of Seats (Addition, Subtraction, and the Number System)

Mathematical Emphases

❶ The Base-Ten Number System Extending knowledge of the number system to 100,000 and beyond

Math Focus Points

- Reading, writing, and sequencing numbers to 10,000 and 100,000
- Understanding the place-value relationships between 10, 100, 1,000, and 10,000
- Learning the names of places larger than 100,000: million, billion, trillion

❷ Computational Fluency Adding and subtracting accurately and efficiently

Math Focus Points

- Adding and subtracting multiples of 100 and 1,000
- Finding the difference between a number and 10,000
- Finding combinations of 3-digit numbers that add to 1,000
- Solving addition and subtraction problems with large numbers by focusing on the place value of the digits
- Solving whole-number addition and subtraction problems efficiently
- Using clear and concise notation for recording addition and subtraction strategies
- Interpreting and solving multistep problems

❸ Whole-Number Operations Examining and using strategies for subtracting whole numbers

Math Focus Points

- Identifying, describing, and comparing subtraction strategies by focusing on how each strategy starts
- Analyzing and using different subtraction strategies
- Developing arguments about how the differences represented by two subtraction expressions are related (e.g., 1,208 – 297 and 1,208 – 300)
- Understanding the meaning of the steps and notation of the U.S. algorithm for subtraction

This Unit also focuses on

- Using story contexts and representations, such as number lines, to explain and justify solutions to subtraction problems
- Solving division problems related to the multiplication combinations to 12×12 (the division facts, e.g., $64 \div 8$, $54 \div 6$) with fluency

Ten-Minute Math activities focus on

- Recognizing and interpreting the value of each digit in 4- and 5-digit numbers
- Finding different combinations of a number, using only 1,000s, 100s, 10s, and 1s and recognizing their equivalency (i.e. 1 hundred, 3 tens, and 7 ones = 12 tens and 17 ones, etc.)
- Reading and writing numbers up to 100,000
- Adding multiples of 10 to, and subtracting multiples of 10 from, 4- and 5-digit numbers
- Estimating solutions to 2- and 3-digit multiplication and division problems
- Breaking apart, reordering, or changing numbers mentally to determine a reasonable estimate

Assessed Benchmarks

- Read, write, and sequence numbers up to 100,000
- Solve subtraction problems accurately and efficiently, choosing from a variety of strategies
- Demonstrate fluency with division problems related to the multiplication combinations to 12 x 12 (division facts)

What's That Portion? (Fractions and Percents 1)

Mathematical Emphases

❶ Rational Numbers Understanding the meaning of fractions and percents

Math Focus Points

- Interpreting everyday uses of fractions, decimals, and percents
- Finding fractional parts of a whole or of a group (of objects, people, and so on)
- Finding a percentage of a group (of objects, people, and so on)
- Finding a percentage of a rectangular area
- Identifying fraction and percent equivalents through reasoning about representations and known equivalents and relationships
- Finding fractional parts of a rectangular area
- Interpreting the meaning of the numerator and denominator of a fraction
- Using equivalent fractions and percents to solve problems
- Representing fractions on a number line

❷ Rational Numbers Comparing fractions

Math Focus Points

- Ordering fractions and justifying their order through reasoning about fraction equivalents and relationships
- Comparing fractions and percents to the landmarks 0, ½, and 1
- Finding and comparing fractional parts and percents of a whole or a group
- Comparing fractional parts of different-sized wholes
- Using equivalencies to place fractions on a set of number lines (fraction tracks)
- Comparing fractions on a number line
- Ordering mixed numbers and fractions greater than 1

❸ Computation with Rational Numbers Adding and subtracting fractions

Math Focus Points

- Finding fractional parts of the rotation around a circle
- Adding fractions by using a rotation model
- Adding and subtracting fractions through reasoning about fraction equivalents and relationships
- Adding and subtracting fractions by using a number line
- Finding combinations of fractions with sums between 0 and 2

Ten-Minute Math activities focus on

- Estimating solutions to 3-, 4-, and 5-digit addition and subtraction problems
- Breaking apart, reordering, or changing numbers mentally to determine a reasonable estimate
- Identifying fractions of a group
- Using evidence and formulating questions to make hypotheses about the common characteristics of groups of people
- Systematically eliminating possibilities

Assessed Benchmarks

- Use fraction-percent equivalents to solve problems about the percentage of a quantity
- Order fractions with like and unlike denominators
- Add fractions through reasoning about fraction equivalents and relationships

Measuring Polygons (2-D Geometry and Measurement)

Mathematical Emphases

❶ Features of Shape Describing and classifying 2-dimensional figures

Math Focus Points

- Identifying attributes of polygons
- Describing triangles by the sizes of their angles and the lengths of their sides
- Using attributes to describe and compare quadrilaterals, including parallelograms, rectangles, rhombuses, and squares
- Defining a regular polygon as a polygon with all sides and all angles equal

❷ Features of Shape Describing and measuring angles

Math Focus Points

- Using known angles to find the measures of other angles

❸ Linear and Area Measurement Finding perimeter and area of rectangles

Math Focus Points

- Comparing the perimeters and areas of rectangles when the dimensions are multiplied by given amounts
- Using numerical and/or geometric patterns to describe how the perimeters and areas of rectangles change when the dimensions change
- Using representations to explain how perimeters and areas of rectangles change
- Creating different rectangles with the same area but different perimeters
- Understanding square units as a unit of measure
- Creating different rectangles with the same perimeter but different areas
- Describing the shapes of rectangles that have the same area or the same perimeter

❹ Features of Shape Creating and describing similar shapes

Math Focus Points

- Recognizing and building similar figures
- Examining the relationship among angles, line lengths, and areas of similar polygons
- Making a generalization about the changes in area of similar figures
- Building similar figures for polygons made from two or more Power Polygon pieces
- Using Power Polygons™ to find the areas of similar hexagons

Ten-Minute Math activities focus on

- Decomposing images of 2-D shapes and then recombining them to make a given design
- Developing language and concepts to communicate about spatial relationships
- Organizing and analyzing visual images
- Describing features of the data
- Interpreting and posing questions about the data

Assessed Benchmarks

- Identify different quadrilaterals by attribute, and know that some quadrilaterals can be classified in more than one way
- Use known angle sizes to determine the sizes of other angles (30˚, 45˚, 60˚, 90˚, 120˚, and 150˚)
- Determine the perimeter and area of rectangles
- Identify mathematically similar polygons

Decimals on Grids and Number Lines (Decimals, Fractions, and Percents 2)

Mathematical Emphases

❶ Rational Numbers Understanding the meaning of decimal fractions

Math Focus Points

- Identifying everyday uses of fractions and decimals
- Representing decimal fractions as parts of an area
- Reading and writing tenths, hundredths, and thousandths
- Identifying decimal, fraction, and percent equivalents
- Representing decimals by using a number line
- Interpreting fractions as division
- Interpreting the meaning of digits in a decimal number

❷ Rational Numbers Comparing decimal fractions

Math Focus Points

- Ordering decimals and justifying their order through reasoning about decimal representations, equivalents, and relationships
- Comparing decimals to the landmarks 0, ½, and 1

❸ Computation with Rational Numbers Adding decimals

Math Focus Points

- Estimating sums of decimal numbers
- Using representations to add tenths, hundredths, and thousandths
- Adding decimals to the thousandths through reasoning about place value, equivalents, and representations

This Unit also focuses on

- Explaining mathematical reasoning

Ten-Minute Math activities focus on

- Reading and writing numbers up to 100,000
- Adding multiples of 10 to, and subtracting multiples of 10 from, 4- and 5- digit numbers
- Reading and writing decimal fractions and decimal numbers
- Adding tenths or hundredths to, and subtracting them from, decimal fractions and decimal numbers
- Estimating solutions to 1- and 3-digit multiplication and division problems
- Breaking apart, reordering, or changing numbers mentally to determine a reasonable estimate

Assessed Benchmarks

- Read, write, and interpret decimal fractions to thousandths
- Order decimals to the thousandths
- Add decimal fractions through reasoning about place value, equivalents, and representations

How Many People? How Many Teams? (Multiplication and Division 2)

Mathematical Emphases

❶ Whole-Number Operations Reasoning about equivalent expressions in multiplication and division

Math Focus Points

- Generating equivalent multiplication expressions by doubling (or tripling) one factor and dividing the other by 2 (or 3)
- Using story contexts and representations to support explanations of the relationship between equivalent expressions
- Developing arguments about how to generate equivalent expressions in multiplication
- Comparing equivalent multiplication expressions to equivalent division expressions
- Generating equivalent division expressions

❷ Whole-Number Operations Representing the meaning of multiplication and division

Math Focus Points

- Representing equivalent expressions in multiplication
- Representing equivalent expressions in division
- Representing a division problem with a picture or diagram
- Creating a story context for a division expression

❸ Computational Fluency Solving multiplication problems with 2-digit and 3-digit numbers

Math Focus Points

- Solving 2-digit by 2-digit or 3-digit multiplication problems fluently
- Describing and comparing strategies used to solve multidigit multiplication problems
- Estimating answers to multiplication and division problems
- Understanding the U.S. algorithm for multiplication

❹ Computational Fluency Solving division problems with 2-digit divisors

Math Focus Points

- Describing and comparing strategies used to solve division problems
- Solving division problems with a 2-digit divisor fluently

This Unit also focuses on

- Using clear and concise notation
- Solving multistep word problems
- Using all four operations to solve problems

Ten-Minute Math activities focus on

- Identifying prime, square, even, and odd numbers
- Determining if one number is a factor or multiple of another
- Estimating solutions to 2-digit to 4-digit multiplication and division problems
- Estimating solutions to addition and subtraction problems with fractions and mixed numbers
- Breaking apart, reordering, or changing numbers mentally to determine a reasonable estimate

Assessed Benchmarks

- Explain why doubling one factor in a multiplication expression (a x b) and dividing the other by 2 results in an equivalent expression
- Solve multiplication problems efficiently
- Solve division problems efficiently

Growth Patterns (Patterns, Functions, and Change)

Mathematical Emphases

❶ Using Tables and Graphs Using tables to represent change

Math Focus Points

- Using tables to represent the relationship between two quantities

❷ Using Tables and Graphs Using graphs to represent change

Math Focus Points

- Plotting points on a coordinate grid to represent a situation in which one quantity is changing in relation to another
- Identifying points in a graph with corresponding values in a table and interpreting the numerical information in terms of the situation the graph represents
- Describing the relative steepness of graphs or parts of graphs in terms of different rates of change
- Comparing situations by describing differences in their graphs

❸ Linear Change Describing and representing situations with a constant rate of change

Math Focus Points

- Describing the relationship between two quantities in a situation with a constant rate of change, taking into account a beginning amount and a constant increase (or decrease)
- Finding the value of one quantity in a situation with a constant rate of change, given the value of the other (e.g., If you know the age, what is the height? or If you know the number of rows, what is the perimeter?)
- Writing an arithmetic expression for finding the value of one quantity in terms of the other in a situation with a constant rate of change
- Making rules that relate one variable to the other in situations with a constant rate of change
- Using symbolic letter notation to represent the value of one variable in terms of another variable

❹ Nonlinear Change Describing and representing situations in which the rate of change is not constant

Math Focus Points

- Comparing tables, graphs, and situations with a constant rate of change with those in which the rate of change is not constant
- Describing a situation in which the rate of change is not constant but can be determined
- Describing how a graph represents a situation in which the rate of change is not constant

This Unit also focuses on

- Measuring length with meters and centimeters
- Finding the perimeter of a rectangle
- Finding the area of a rectangle

Ten-Minute Math activities focus on

- Estimating solutions to 3- to 5-digit addition and subtraction problems
- Breaking apart, reordering, or changing numbers mentally to determine a reasonable estimate
- Reading and writing numbers up to 100,000
- Adding multiples of 10 to, and subtracting multiples of 10 from, 3- to 5-digit numbers
- Reading and writing decimal fractions and decimal numbers
- Adding tenths or hundredths to, and subtracting them from, decimal fractions and decimal numbers

Assessed Benchmarks

- Create graphs and tables to represent the relationship between two variables
- Use tables and graphs to represent the relationship between two variables
- Use symbolic notation to represent the value of one variable in terms of another variable in situations with constant rates of change

How Long Can You Stand on One Foot? (Data Analysis and Probability)

Mathematical Emphases

❶ Data Analysis Representing data

Math Focus Points

- Using a line plot to represent ordered, numerical data
- Representing two sets of data in order to compare them
- Considering how well a data representation communicates to an audience

❷ Data Analysis Describing, summarizing, and comparing data

Math Focus Points

- Comparing sets of data using the shape and spread of the data
- Describing the shape of a set of data: where the data are concentrated, the median, what is typical, highest and lowest values, range, and outliers
- Using medians to compare groups

❸ Data Analysis Analyzing and interpreting data

Math Focus Points

- Developing arguments based on data
- Drawing conclusions based on data
- Considering how well conclusions are supported by data

❹ Data Analysis Designing and carrying out a data investigation

Math Focus Points

- Designing an experiment to answer a question about two groups, objects, or conditions
- Developing and carrying out consistent procedures for collecting data from an experiment
- Recording and keeping track of a set of data
- Carrying out multiple trials in an experiment

❺ Probability Describing the probability of an event

Math Focus Points

- Comparing the expected probability of an event with the actual results of repeated trials of that event
- Using numbers from 0 to 1 as measures of probability
- Determining the fairness of a game based on the probability of winning for each player

Ten-Minute Math activities focus on

- Describing features of data
- Interpreting and posing questions about data
- Estimating 2-, 3-, and 4-digit multiplication and division problems
- Breaking apart, reordering, or changing numbers mentally to determine a reasonable estimate

Assessed Benchmarks

- Describe major features of a set of data represented in a line plot or bar graph, and quantify the description by using median or fractional parts of the data
- Draw conclusions about how two groups compare based on summarizing the data for each group
- Design and carry out an experiment in order to compare two groups
- Use a decimal, fraction, or percent to describe and compare the theoretical probabilities of events with a certain number of equally likely outcomes